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Railway Age

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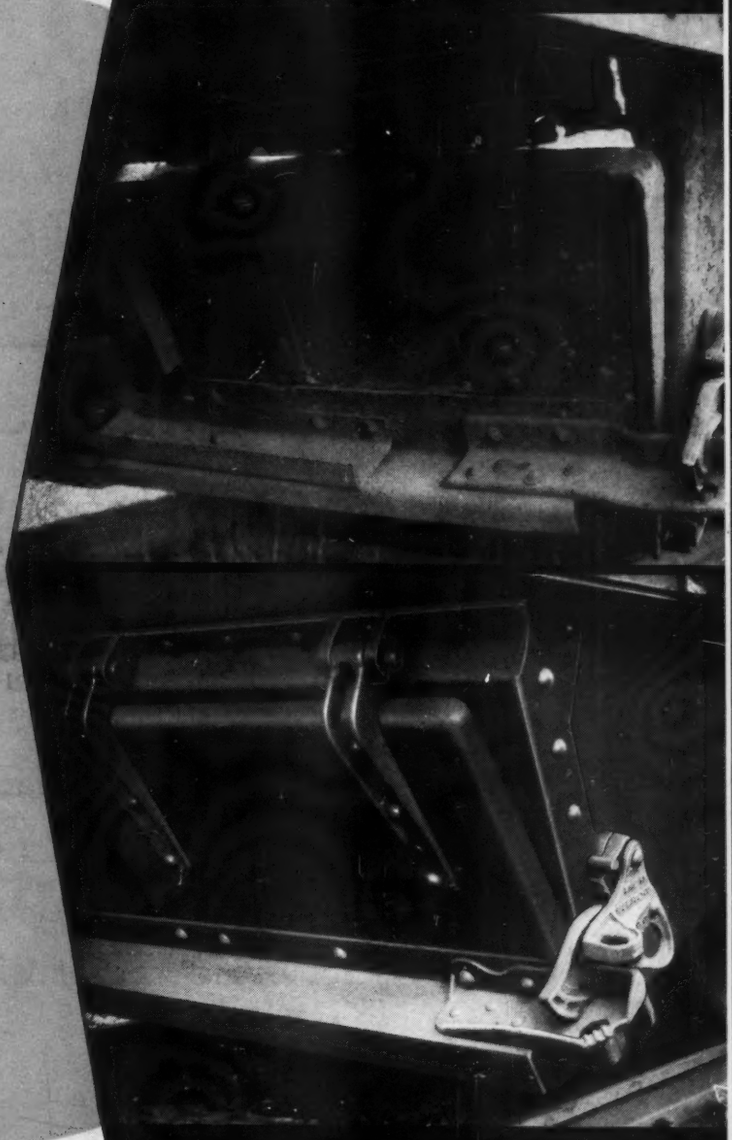
STOP

LOSS OF LADING WITH WINE HOPPER FRAMES

WITHOUT WINE HOPPER FRAME

WEAKNESS • DETERIORATIO

CORROSION • DISTORTIO



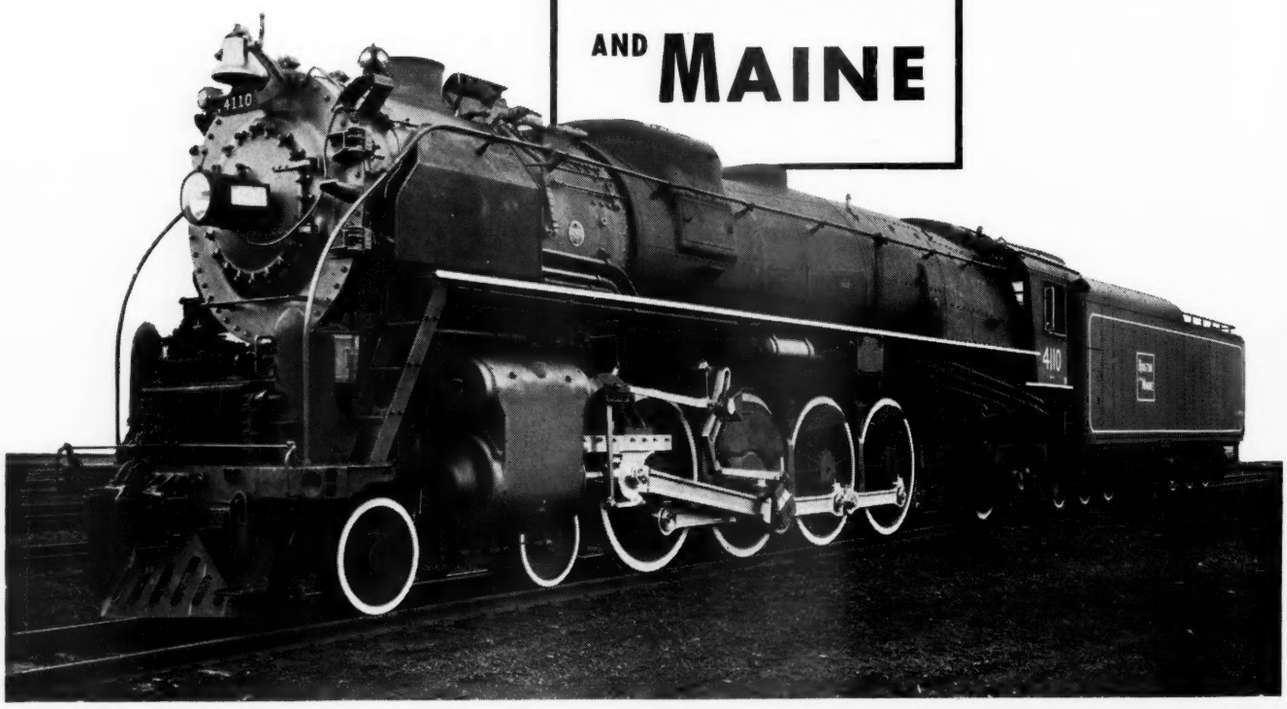
WITH WINE HOPPER FRAMES

PERMANENT DOOR FIT

INCREASED STRENGTH

THE WINE RAILWAY APPLIANCE CO. • TOLEDO, OHIO

BOSTON AND MAINE



5 IN 1935...

5 IN 1937...

3 IN 1939...

Repeat orders for these 4-8-2 type locomotives—used by the Boston and Maine Railroad in fast freight and heavy passenger service—furnish the best evidence of satisfactory economical operation.

BLW THE BALDWIN GROUP

THE BALDWIN LOCOMOTIVE WORKS

Philadelphia

Published weekly by Simmons-Boardman Publishing Corporation, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter, January 4, 1933 at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription price, $6.00 for one year U. S. and Canada. Single copies, 25 cents each. Vol. 108, No. 6.

RAILWAY AGE

The Manufacturers and the R. Rs.

Several responsible business executives have endeavored to point out to us errors in our recent criticism of the National Association of Manufacturers for alleged inconsistency in demanding the application to manufacturing of certain government policies necessary to its maintenance and prosperity as private enterprise, while refusing to advocate application of similar government policies to transportation. In general, the errors attributed to us may be grouped as follows:

1. We treat the railroad industry and the manufacturing industry as equally private enterprise, whereas many manufacturers do not regard transportation as "private enterprise" in the same sense as manufacturing and therefore requiring and entitled to similar government treatment.

2. We overlook the fact that the N. A. M. is an organization of manufacturers, and therefore cannot be expected to give expert advice on public policy for the cure of economic ills which lie outside its proper field.

3. Our critics maintain that the proper method to restore the operation of free enterprise is to reduce the scope of government regulation. Instead, they assert, the railroads—and the *Railway Age*—are not striving to have regulation of the railroads reduced, but are demanding increased regulation of their competitors. Such increased regulation, they maintain, is no way to restore the attributes of private enterprise to transportation.

4. "Subsidized competition" is asserted to be no serious handicap to the railroads; their troubles, it is contended, arise almost solely from over-regulation and from domination by the labor unions—handicaps which the railroads themselves are making no serious effort to throw off.

What Is Private Enterprise?

In the following we shall examine these criticisms to see to what extent, if any, they may be valid. And, first, what is private enterprise? Our definition is, *"Private ownership, and the development and operation by private citizens, entirely at their own expense, of facilities of production, distribution and exchange of goods, subject only to such government regulation as may be necessary in the public interest to control natural monopolies and assure fair competition in industries that are not natural monopolies."* Under this definition our railroads are entirely private enterprises, while no other means of transportation whatever in this country is entirely a private enterprise. We advocate for transportation the government policies that we do for the purpose of forcing all transportation to become private enterprise in accordance with this definition. If any manufacturer or spokesman for manufacturers has the hardihood to challenge this definition, we shall be glad to receive his challenge and his reasons for making it.

Curiously enough, one of the reasons we have been given why manufacturers do not regard the railroads as private enterprise is that the railroads are subject to regulation and are so much regulated. Why, then, in its pamphlet "A Study of Depressions," did the N. A. M. state as one of the reasons for the prolongation of the depression the following: "An attitude (by government) toward *public utilities,* both with regard to financing and *tax-subsidized government competition,* which has enormously slowed up expansion in a vital part of our national economy."

Public utilities are natural monopolies rendering a public service, and therefore subjected to regulation similar to, although not yet as injurious as that applied to the railroads. If public utilities should be considered private enterprise, certainly the railroads should be. And if "tax-subsidized competition" with the public utilities produces such harmful results, certainly tax-subsidized competition with the railroads must. *Why, then, the difference between the attitude of the N. A. M. and its members toward public utilities and railroads?* Is it possible it is because many manufacturers are in indirect and—as private transporters—even direct competition with the railways, and for this and other reasons believe they have not the same *selfish* interests in the way that public utilities and railroads are treated? It is not only possible—it is only too plainly evident.

Next, let us consider the contention that the N. A. M., being an organization of manufacturers, has no real responsibility to give expert advice toward the formation of public policy outside its own industrial bailiwick. The best answer to this "include-us-out" contention is to be found in the "platform" of the N. A. M.'s "Congress of American Industry," adopted at its annual convention on December 7, 1939, which contained the following paragraphs:

No Disclaimer of Responsibility Here

"Industrial management in America is equipped to contribute effectively, in its own sphere, to a constructive solution of the problems the nation faces. The maximum result will be attained with sound governmental policies and with all elements of the economy—industry, agriculture, labor, distribution, *transportation,* banking and finance and the rest—striving to serve the

public good. It must be made clear to the public that industry's enlightened self-interest is linked inextricably with the welfare of *all* these other elements and with the welfare of the nation as a whole.

"Industrial management must continue to do all in its power to keep alive the faith of the public in the traditional American principles of free enterprise, as the guarantor of individual opportunity and security by fulfilling its share of the public responsibility resting upon *all private enterprise.*"

Those paragraphs don't sound to us much like a disclaimer that the N. A. M. has constructive thoughts to offer to the government and the public on policies affecting the welfare of the American people beyond the limited bailiwick of manufacturing itself. And, as a matter of fact, the N. A. M. *did* adopt a resolution on transportation, indicating an acceptance of responsibility in helping establish public policy with regard even to it. If the N. A. M. were an organization making no claims beyond that of protecting the interests of manufacturers, no criticism could be offered of its failure to make recommendations regarding transportation in accord with the national welfare. But it takes no such narrowly selfish view in its general declarations; and we are glad it does not.

And what we criticize it and also the United States Chamber of Commerce for is that they do announce themselves to the American people as advocates of a *complete* system of private enterprise; and then immediately show they are not—that they even advocate the application by government to *public utilities* as well as other industries of the policies necessary to preserving private enterprise, and at the same time adopt resolutions regarding transportation of an entirely different import, while many of their most influential members actively and constantly promote government policies regarding transportation *exactly the opposite* of these they advocate for other industries.

N. A. M. Needs Deeper Faith in Its Own Principles

We are convinced that the responsible leaders in the N. A. M. are keenly alive to its social responsibilities; and that they are honestly and intelligently endeavoring to gain the acceptance of principles which will insure the prosperity of the country. The criticism which we have offered has been of constructive intent. That is, we believe so firmly in the principles of free enterprise which the N. A. M. supports that we do not wish to see the effectiveness with which it propounds these principles lost by having destructive critics point out that this great organization fails to practice the doctrine that it preaches.

Let us look ahead to the approaching Presidential election. As far as can now be foreseen, the voters are likely to be given a choice between political groups one of which, in a general way, will favor a return to basic principles of free enterprise, while the other will endorse continuance of government interference all along the line in the alleged interest of the "submerged third." In such a division we shall be all for the free enterprise group as the only one likely to restore political conditions which will make possible the economic recovery of the country. In this position we believe most of the manufacturers of the country will agree with us. But suppose that in the meantime certain powerful business interests continue their active lobbying and propaganda for additional enormous appropriations for the construction of waterways and superhighways—and that representative organizations of business men fail in any way to dissociate themselves from such activities, but appear to condone them? What then?

How Would This Speech Sound on the Radio?

Do the true friends of free private enterprise, as most business men believe themselves to be, think that the chances of political victory for the friends of private enterprise are going to be improved if a mellifluous voice comes over the radio next fall to the following effect—*and if the people know what it says is true?*

"My friends, our opponents have assailed us for our efforts to increase the welfare of the unemployed by liberal appropriations for the W. P. A., for our youth, for our farmers, for our slum-dwellers. They have accused us of forsaking the principles of free enterprise. They have constantly reminded us that 'The people ought to support the government, not the government the people.'

"But, while these Princes of Privilege have denounced our efforts in behalf of the common man, let us not overlook the fact that business men and business organizations have also been demanding and getting, within recent years, and are still demanding and getting, the largest appropriations of the taxpayers' money that history has ever recorded.

"Senator Bailey, chairman of the Senate Commerce Committee, last year called our attention to the fact that the federal government has expended more money upon the improvement of our inland waterways in the past decade than in more than a century before. My friends, it was not the slum-dwellers, or the unemployed, or the farmers who asked for these appropriations. Just stand on the bank of one of our improved waterways, and look at the distinguished corporate names that you will see on the barges which plow by. Or consider our vastly increased appropriations of the taxpayers' money for the construction of highways—appropriations that have been promoted, and are still being promoted, by huge corporations which, significantly enough, are the principal beneficiaries, through business profits, of the increased construction of highways and of their increased and increasing use by both pleasure and commercial vehicles.

"My friends, you will find most of the captains of industry and finance who have received these unprecedented favors at the hands of the federal government in the camp of our opposition. But you will also find that, in denouncing appropriations of tax

moneys for the benefit of the farmers, and the unemployed, and the slum-dwellers, they have been strangely silent about the unprecedented appropriations which government has made to the enrichment of particular business interests. What they are asking you to do, my friends, is to cut off the use of tax funds for the relief of the unemployed, and the farmers and the slum-dwellers, who need our helping hand, in order that the government can continue and even increase the appropriations of your tax money for the benefit of some of our most profitable and soulless corporations."

We submit that if business can be tarred with the above stick in the coming election the chances of getting back to a political regime under which private enterprise may have a chance to restore prosperity will thereby be impaired. And we do not see how business can avoid being smeared in this manner unless substantial organizations of business men quickly dissociate themselves from those few interests among them (and they are small in number, if not in size or wealth or influence) that are enjoying this huge largess. Are we unduly alarmed lest all private business be blamed for the misdeeds of a few? If so, we appear to be in distinguished company—else why is President Carey of the Chamber of Commerce of the United States making addresses to business men urging them to forswear appropriations of tax money for projects of local benefit? And, we may add, why did Senator Reed of Kansas make, without success, to the National Industrial Traffic League, a plea which is in every way parallel to that which we have been making to the membership of the Chamber of Commerce of the United States and the National Association of Manufacturers?

In conclusion, then, to the contention that the N. A. M. has no responsibility for the state of the transportation industry, we answer that this contention squares neither with the N. A. M.'s public declaration of its sphere of interests, nor with what is politically expedient from its standpoint.

How About an Equalized "Commodities Clause"?

As for objection No. 2, that the railroads ought to be demanding less regulation for themselves rather than more regulation for their competitors—it can be stated that the railroads are not asking for more regulation *per se* for their competitors, but only regulation that will put all transportation competitors on a basis of equality. We know of no responsible railroad men who would not as soon accept equality with competing carriers established by reduction of regulation all around as by an increase of regulation. If the preponderant opinion of responsible business men favors this solution, let them honestly and whole-heartedly support it, and they will find, we predict, that railroad men will help them. But the railroads know only too well from too much sad experience that the interests which most strenuously oppose further regulation of rival transport agencies always *equally oppose any mitigation of the regulatory restraints on the railroads.*

Regarding objection No. 3—that "subsidized competition" is but a minor difficulty for the railroads, and that over-regulation and domination by the unions are the principal causes of their troubles, we shall divide our answer in two parts. First, as to the comparative importance of unequal regulation and "subsidized competition" as causes of the distress of the railroads, it may be answered that all that equalized regulation could possibly do for the railroads would be to reduce to some extent their obstacles in competing for business; *whereas, except for the subsidies, most of their competition would not exist at all.* This is unquestionably true with respect to inland river and canal competition—there would not be any of it except for the subsidies. Furthermore, the majority of competition by both waterways and highways is by *private and contract carriers,* which can not be effectively reached by any regulation excepting a new "commodities clause" that will prohibit all corporations from combining transportation and other businesses as the existing commodities clause prohibits the railroads from combining them.

Those who hold to a solution of railway difficulties through the *removal of regulation* from the railroads must certainly be willing to concede that the railroads should be permitted to engage in manufacture and oil-production, just as manufacturers and oil-producers are permitted to engage in transportation—*but are they willing to concede this?* Concede the railroads this right, and also permit them, as other business is permitted, to run barges and ships and trucks and pipelines where they will—and we will readily concede that a lot might be done to put the railroads back on their feet merely by changes in regulation and without much concern as to subsidies.

As to the suggestion that a large part of the difficulties of the railroads stem from too great an acquiescence on their part in domination by unions of their employees, there is a considerable degree of truth in it. But the railroads are bound hand and foot by government and politics—and their business critics have helped for years to put them in chains. Nobody whose very life depends upon political good will can continue to exist unless he has *some* votes with which to command the respect and sympathy of the political authorities. Railroad managements have no votes of any numerical significance of their own.

Railroad stockholders have largely been expropriated and have lost political interest where financial interest has ceased to exist. Railroad bondholders are to such a large extent big institutions, which, on the one hand, are fearful of criticism if they enter the political arena and, on the other hand, are hesitant to proclaim publicly the jeopardy of their investments lest they scare away customers. Railroad customers (i. e., the large industrial shippers) have very largely left the determination of their policies toward transportation to their industrial traffic managers; and many, if not most, traf-

fic managers are interested in immediate showings of rate reductions rather than in the long-run health of either transportation or the economy as a whole.

Labor Leaders Have More Foresight than Business Leaders

Railway labor, alone of all the elements in the population with sufficient voting strength to command the respect of politicians, has shown an increasing understanding of its interest in fair political treatment for the railroads; and increasingly—with some notable exceptions—it has made its voice heard in behalf of the industry which gives it employment. With the railroads as dependent as they are upon the good will of politicians, is it any wonder they look with perhaps excessive tolerance on the demands of the only large group in the country which gives them some influence with governmental authorities? *Why should agriculture and business be critical of railroad liberality toward the railway unions, while at the same time agriculture and business do nothing to make railway managements less dependent upon the political power of the labor unions for a square deal from the politicians?* Railway labor has gained its great and costly power largely because railway customers have taken a less farsighted and a less intelligently-selfish view regarding public policy toward the railroads than have many of the railway labor leaders.

We respect the opinions of those who have attempted to refute our criticisms of business organizations which refuse to include transportation in their demands for a return to the principles of free enterprise—but we are more convinced than ever that they err, and that persistence in their error will have disastrous political and economic consequences for the country, including the very interests that believe that present shortsighted transportation policies are benefiting them.

A Halting Step in a Healthy Direction

The Naval Stores decision, I. C. C. Docket 27571, reviewed in *Railway Age* of February 3, page 254, broadly points the way to a sound basis for determining competitive rights of the different forms of transportation. The majority, it is true, failed to be as specific as it might have been, but the concurring opinion of Chairman Eastman expounded a doctrine for competitive rate-making which practically parallels that which has been aimed at for many months in these pages.

It seems significant that the Commission permitted the railroads to establish the rates their judgment dictated as necessary to enable them to participate in this naval stores business. Moreover, the I. C. C. said, at least inferentially, that it would interpose no objection so long as such rates do not cast a burden upon other traffic.

On the other hand, the Commission can take no pride in the fact that it dawdled for almost 1200 days before reaching this decision, depriving these needy railroads of the right to participate in this important traffic during this period—when the law provides that such questions should be decided within 210 days. The Commission had better cease using its suspension power unless it can improve on this record. Justice done only after such long delay is not full justice.

On its face, the report actually does nothing more than permit the railroads to exercise sound managerial discretion in establishing rates to meet motor truck competition. Inferentially, however, it suggests that no agency should ordinarily be permitted to go below its costs to attract competitive traffic. There appears to be a warning to carriers that they should well consider each particular situation before deciding to go even this low. There seems to be a definite leaning to the view that the competitive rate problem should be adjudicated by establishing rates differentially related to reflect roughly the inherent economies of each form of transportation—with due consideration given to the likelihood that shippers may provide their own facilities if rates are established which are materially out of line with costs of shipper-operated service.

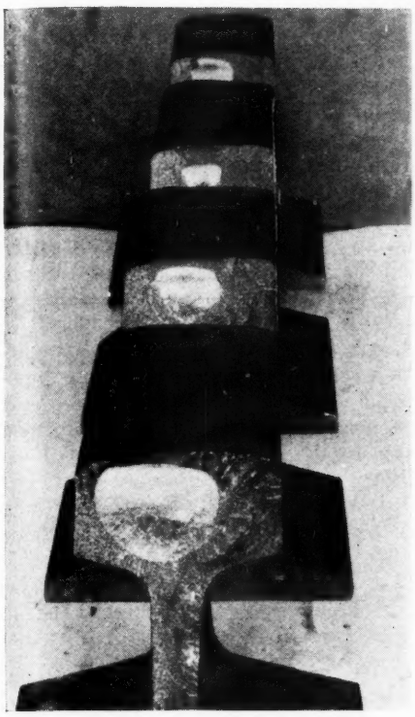
The question whether costs should include or exclude the so-called fair return on investment is left unanswered. This is an important question to the railroads—yet it is unthinkable that return on investment, a concept intended to protect railroad earnings but never taken seriously by the I. C. C. to that end, could now be used by it as a means of depriving the carriers of earnings.

Profit is an element of cost only when market conditions permit it to be considered. It can fairly be used by regulatory authorities in establishing minimum rates only when *new services* are being considered—that is to say, no new competitor should get a certificate of convenience and necessity unless the rates he will charge will pay a fair return on his investment; but this provision loses its validity once an investment has been made—because then a rate which will earn little profit or even none at all may be the only alternative to an actual operating loss.

Another vital question in the regulation of competing transportation remains unanswered in this decision. The record shows that the motor carrier competitor in this case paid only about 20 cents per hour for the skilled labor used to drive his motor trucks. While the Commission has no jurisdiction over wage rates, it would seem strange if it permitted a carrier to use a low rate of wages as a factor in fixing rates which would take business away from a carrier which pays reasonable wages.

The principles, only broadly enunciated in the Naval Stores decision (except by Chairman Eastman) need to be given a more certain meaning if a bottom is to be put under the rate structure. Is there any other approach except this one which the Interstate Commerce Commission seems inclined to adopt which promises as surely to stabilize transportation upon a sound and profitable basis?

Is the Transverse Fissure Problem Growing?*



Four Transverse Fissures in a Two-Foot Length of Rail

Larger number of defects found is attributed to improved methods of detection, heavier wheel loads, high speeds, and greater rail life

By Harcourt C. Drake

Director of Research, Sperry Products, Inc.

IN the period from 1930 to 1933, the number of transverse fissures detected in rails jumped from 8 to 17 per 100 miles of track tested, and from 1933 to the present time, detected transverse fissures have increased further to more than 23 per 100 miles of track tested. What has brought about this sharp increase? To what extent does the answer lie in the quality of the rails that have been produced; to the lengthened service life of the rails; to increased axle loads and increased speed; to improvements in the technic of detecting fissures, or to other factors? To answer these questions requires at least a brief review of the transverse fissure problem and of developments in methods of detection, as well as an analysis of the records of the failures that have been found within the years under consideration.

A Long-Standing Problem

The internal transverse fissure is a transverse fatigue failure in the rail head, having as its nucleus some minute shatter crack or other discontinuity in the steel. The growth of the normal transverse fissure appears to be gradual, the fracture progressing slowly, with the fissure faces acquiring a high polish as the result of the peening action of the wheel load moving over the rail head. Occasionally, however, a fissure develops very rapidly, in which case the fracture usually discloses a series of growth rings, frequently accompanied by large unpolished areas, the latter indicating that sudden rupture had taken place, affording insufficient time to permit the polishing of the fracture surfaces. The danger inherent in these internal transverse fissures lies in the absence of any visible evidence of their presence in the rail, and also in the fact that there are frequently several well-developed fissures in one rail. Based on the records of fissure detection in 1938, one out of every eight fissured rails contains two or more transverse fissures.

While transverse fissures had not been unknown prior to 1911, a disastrous accident on the Lehigh Valley, at Manchester, N. Y., on August 25 of that year, focused attention on them as the most dangerous type of rail failure. In the years immediately following this accident, many attempts were made to develop a practical means for detecting internal transverse fissures in rails in track, these including the sonic, or sounding method, the X-ray method, the magnetic method, and the electrical method. Of these different methods, the first three mentioned proved unreliable, and the sonic and X-ray methods were entirely impracticable for the out-of-face testing of rails in track. On the other hand, the electrical method, developed under the direction of Dr. Elmer A. Sperry, proved entirely practicable, both in the laboratory and the field.

The Electrical Method of Testing

Dr. Sperry became interested in the problem of fissure detection in 1923. His initial investigation was based on the known fact that an internal transverse crack in a metal bar acts as a point of high resistance to the flow of direct current. He demonstrated that the resulting minute increase in unit e. m. f. (electro motive force) at this point of high resistance could be used to locate

* Adapted from a paper presented before the University of Michigan-Life Conference on New Technologies in Transportation, at Ann Arbor, Mich., on November 3, 1939. Since the presentation of this paper, the 1939 figures relative to miles of track tested by Sperry equipment and the number of defective rails found have become available and have been substituted for the 1938 figures which appeared in the original paper.

the defect. In February, 1927, Dr. Sperry, in co-operation with the American Railway Engineering Association, initiated a research program having as its objective the application of the direct-current unit-potential method to the detection of internal transverse fissures in rail. Following successful laboratory tests, a detector car was constructed for the American Railway Association (now the Association of American Railroads) by the Sperry Development Company. As accepted, this car was equipped with a generating plant for supplying 2,000 amp. to each rail. The current was introduced into the rails by two sets of copper brushes, one set being mounted on each side of the car. A searching unit, consisting of a pair of electrically-opposed coils was mounted midway between the current brushes on each side, directly above the rail head and with the axes of the coils transverse to the rail.

With this equipment, when current was flowing through a sound rail, the flux above the rail head was uniform and no voltage was generated at the terminals of the searching unit. When the current encountered a fissure in the rail head, however, it was forced to pass around the crack, which, through deflection, produced a change in the flux density above the rail head. This variation in flux produced an e. m. f. at the searching unit terminals, as first one coil and then the other passed over the point of decreased flux density. The e. m. f. was led into suitable amplifiers whose output, in turn, operated recording pens as well as equipment for squirting a spot of paint on the rail at the location of the fissure.

The combination of direct current and inductive pickup proved entirely practical and the detector car was placed in operation by the American Railway Association in November, 1928. Dr. Sperry's confidence in the ultimate success of the detector car was demonstrated by the fact that a second car was built and equipped before the first one had been accepted. At about the same time, rail-testing service was established and this second car, the first of the Sperry fleet, started commercial testing in November, 1928.

Mechanics of Modern Detection

Coincident with the establishment of the rail testing service, an extensive program was inaugurated by the Sperry Company to investigate the various problems involved in the detection of rail defects by the direct-current inductive-pickup method. The four following factors were found to militate against the detection of fissures, especially those in rails in track:

(1) The varying flux distribution transversely above the rail head at fissure locations;

(2) The magnetic condition of fissures immediately prior to test;

(3) Magnetic poles in the rail; and

(4) The effects of various surface defects, such as locomotive driver burns, flat spots, corrugations, etc.

The flux distribution above the rail head plays an important part in fissure detection. With a large or cracked-out fissure located in one side of the rail head (Fig. 1), the current which would normally pass through this fractured area must flow around the crack. While some of this current shifts into the web of the rail, the majority remains in the head, thus raising the current density in the area immediately adjacent to the fissure. The absence of current passing through the fissure reduces the flux density immediately above that portion of the rail head designated A-B. This reduction is practically balanced, however, by the increased flux density over B-C, due to the increased current density in the sound portion of the rail head. As a result, a single pair of coils passing along the rail head in the position shown in Fig. 1 would encounter practically no change in total flux and would, therefore, fail to detect the large fissure. To overcome this condition, searching units were developed with multiple pairs of staggered coils (Fig. 2) covering the entire rail head. As shown in Fig. 2 (with the same fissure as in Fig. 1), the pair of coils on the left side of the rail head pass entirely within the area of increased flux density. This results in maximum pickup from the fissure, with a substantial indication.

Overcoming Normal Magnetism

Rail in track is rather strongly magnetized owing to its position in the earth's field and to the fact that it is agitated continually by moving wheel loads. The testing current of the detector car rearranges the steel molecules in the head of the rail in a concentric pattern from right to left. Frequently the molecules at a fissure are alined initially in the opposite direction. Where this condition prevails and the inductive pickup passes over the defect before the molecular realinement has taken

Right, Above—Early Type Sperry Transverse Fissure Detector Equipment. Right —One of the Latest of the Sperry Fleet

place, the fissure will be "missed." The problem in this regard was solved by pre-energizing the rail with a large direct current in advance of the regular detecting current. Direct current of 1,500 amp. is introduced into the rail by a third brush cluster (Fig. 3) located just back of the front trucks, and is led back to additional brushes at the front main brush cluster (Fig. 4).

In the original equipment, strong magnetic poles in the rails occasionally produced false indications, which necessitated repeat runs and hand tests, with their accompanying delays. Investigation showed that these magnetic poles are of two types, those within the rail head and those on the rail surface, the latter being caused by imperfect contact of the main current brushes with the rail. It was found possible to remove the superficial magnetic poles from the rail surface by the installation of suitably designed magnetic masses immediately back of the front main current brushes. False indications due to internal poles were eliminated by raising the testing current density in the rail to approximately 275 amp. per sq. in., at which density the material in the rail head approached magnetic saturation. This change necessitated the installation of generators with a

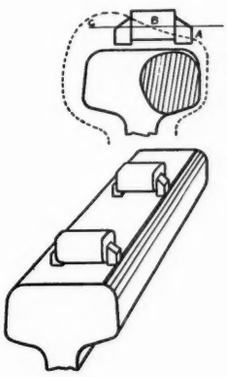


Fig. 1

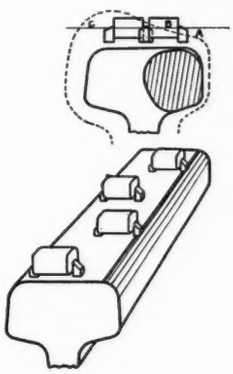


Fig. 2

Fig. 1—Location of Coils in Early Searching Units
Fig. 2—Arrangement of Coils in Later Searching Units

maximum capacity of 8,000 amp., for providing 4,000 amp. per rail.

The number of detector indications caused by locomotive driver burns has been greatly reduced during the last ten years by various improvements in the design of the searching units. The larger burns, however, are still indicated by the multiple-coil searching unit. A detecting system has been developed recently which is relatively insensitive to burns but which is responsive to transverse fissures. This system makes possible the detection of fissures and progressive fractures under driver burns. It consists of two pens of different responsive characteristics. When testing, the recording operator stops to examine and to hand-test all burns indicated by the first and second pens, but disregards all burns indicated alone by the first pen. Up to the present time many transverse fissures and progressive fractures have been located under burns by the initial installations of this equipment. The entire Sperry fleet is being equipped as rapidly as possible; one-half of the fleet having been equipped already.

When the rail testing service was inaugurated it was recognized that data on detected transverse fissures would become increasingly valuable as it accumulated. Therefore, the detector car operators were supplied with forms on which they recorded the types and locations of

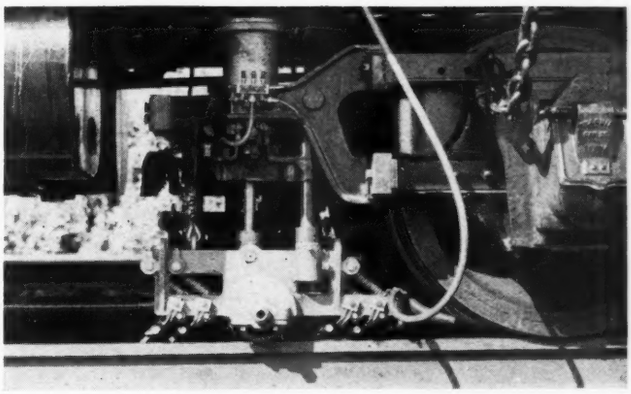


Fig. 3—Premagnetizing Current is Introduced Into the Rail by This Brush Cluster, Located Just Back of the Front Trucks

defects, and all pertinent rail data such as heat number, brand, weight, etc.

In the first year of detector car operation, in which 8,000 miles of track were tested, 643 fissures were located. In 1939, ten years later, 82,000 miles of track were tested in the United States and Canada and approximately 48,000 defective rails were located. These latter defective rails, according to types, were as shown in the accompanying table.

Defective Rails, By Types of Failures, Located in 1939

	Transverse Fissures	Compound Fissures	Horizontal Split Heads	Vertical Split Heads	Miscellaneous
Number of Rails..	18,745	1,934	8,372	15,673	3,242
Miles per Defective Rail	4.4	43	9.8	5.3	25.4
Per Cent of Total	39	4	17	33	7

From this table, it will be noted that transverse fissures represent only 39 per cent of the total defective rails found. Thus, it is evident, that even if the controlled-cooling of rails is completely successful in eliminating transverse fissures, there would still remain a large percentage of rail failures. In 1939, for example, these other failures would have amounted to 61 per cent of all of those found, or 29,221 failures. This represents a defective rail for every 2.81 miles tested. Some of these other types of failures are equally as dangerous as transverse fissures themselves. For example, it is known that frequently the horizontal split head acts as the origin for an internal transverse fatigue failure or compound fissure, in which case it possesses all of the

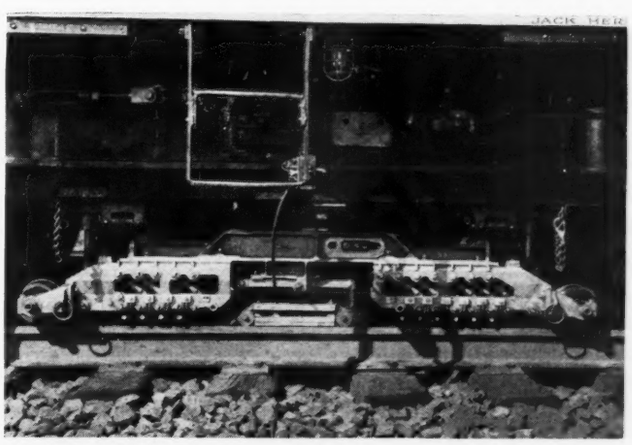


Fig. 4—The Main Current Brush Unit, Showing the Latest Type of Searching Unit Located Between the Brushes

Fig. 5—Chart Showing Annual Test Data and Some of the Factors Affecting Fissure Growth

Fig. 6 — Fissure Growth Curve on the Basis of Repeat Tests Over a Specific Section of Track

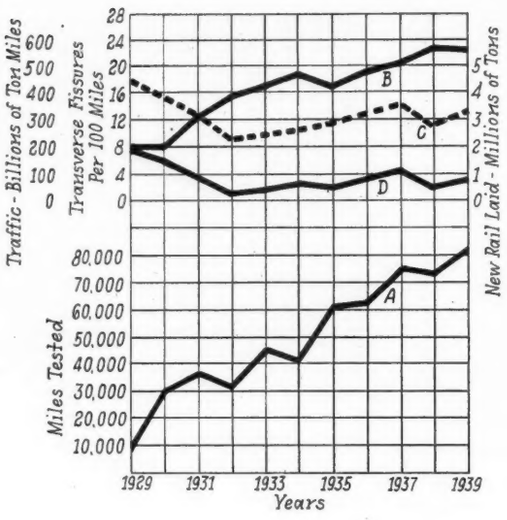


Fig. 5

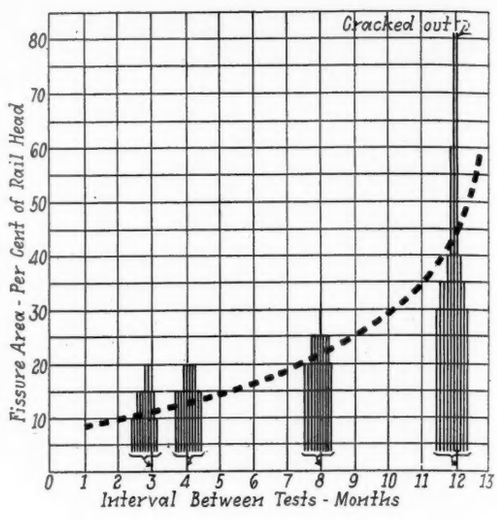


Fig. 6

potential hazard involved in the transverse fissure. On the basis of detected failures, one out of every seven horizontal split heads develops into a compound fissure.

As of December 31, 1939, a total of 549,356 miles of track had been tested and 279,741 defective rails had been located and removed from track. Of these defective rails, 100,570 contained transverse fissures. This defective rail, if laid together in track, would more than extend from New York to Chicago, while the transverse-fissured rails alone would more than build a double track from Ann Arbor, Mich., to Cleveland, Ohio.

Annual testing data and some of the factors affecting fissure growth are shown in the curves of Fig. 5. The Miles Tested curve (A) shows a steady increase from 8,000 miles in 1929 to 82,000 miles in 1939. In the Transverse Fissure curve (B), the jump from 8 to 17 fissures per 100 miles tested over the period from 1930 to 1933 was not due to a sudden increase in the number of fissures in track, but rather to the fact that multiple-coil searching units and premagnetizing equipment were being installed on the detector cars. From 1933 the number of detected transverse fissures has increased from 17 to more than 23 per 100 miles.

The Revenue Ton Miles curve (C) in Fig. 5 shows a continual increase in ton miles since 1932, and the speeds of freight and passenger trains have increased materially over this same period. Both of these factors contribute to fissure growth and their upturn is no doubt responsible in part for the large number of transverse fissures found in 1938 and 1939. The curve of annual rail renewals (D) shows a decrease in the amount of new rail laid during the last eight years, indicating an increase in the average age of rail in track. The relation between rail age and fissure development is illustrated in Fig. 7, where transverse and compound fissures detected in the first six months of 1939 are plotted against the age of rail; no rails rolled earlier than 1930 were included in making this chart. It is noted that only three fissures were found in rail two years old, while 4,080 fissures were found in rail nine years old. In examining this curve, it should be noted that it is not weighed as to the amount of rail tested. Unfortunately, it has been impossible to keep reliable mileage records of the weight and age of rails tested.

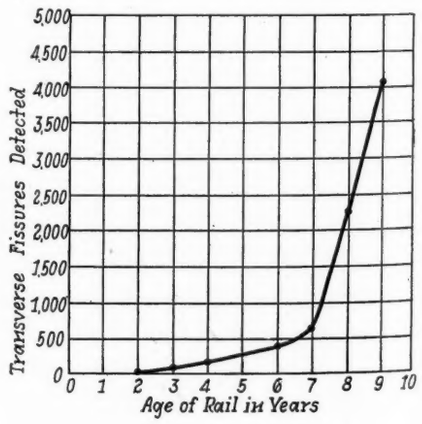
In examining a large amount of failed-rail data for other factors affecting fissure development, two factors were encountered which appeared to show definite trends. The tabulation of several thousand fissures as to whether found in the right or left rail revealed the fact that, in double-track territory, approximately 5 per cent more transverse fissures are found in the right, or outside, rail, than in the left rail; while in single-track territory, the number of transverse fissures is about equally divided between the two sides of the track. This difference in double-track territory may be due to locomotive characteristics or to a difference in the strength of the roadbed or ballast section.

Plotting the location of fissures against their distance from the leaving or receiving ends of the rail results in curves which are consistent from year to year (Fig. 8). These curves show a rather large increase in the number of fissures near the rail ends. A somewhat smaller peak always occurs in the center of the rail, opposite the joint in the opposite rail. Are these fissure peaks near the ends and centers of rails due to the rail joints, some vibration characteristic of the rail, the unequal distribution of shatter cracks, or to some other factor? A 25-per cent reduction in the number of transverse fissures would be realized if they could be leveled off.

How Often Should Rail Be Tested?

In the last decade, 85 railroads in the United States and Canada have tested their tracks with detector cars and practically all of the Class I railroads have been testing periodically, some annually and others two and three times a year. This frequent periodic testing results in the detection and removal of fissures in their earlier stages of growth and is particularly effective in heavy-

Fig. 7—Chart Showing the Relation Between Rail Age and the Development of Fissures



traffic high-speed territory, or where rail with fissure tendencies is found.

The value of frequent testing is indicated clearly in the accompanying tabulation covering four consecutive tests over a sub-division approximately 100 miles long, containing rail with a rather high percentage of transverse fissures.

	Period Since Previous Test	Number of Fissures Found	Average Size of Fissures Found
First Test May, 1937	12 months	83	19.4%
Second Test September, 1937	4 months	56	12 %
Third Test May, 1938	8 months	73	14.5%
Fourth Test August, 1938	3 months	61	10.4%

A somewhat better picture from the standpoint of safety is obtained by plotting to a time basis the ten largest fissures found during each of the four consecutive tests. In such a chart (Fig. 6), the test results are not confused by a large number of small transverse fissures and, as a result, it is possible to draw in an approximate fissure growth curve for this particular section of track. With the 12-months interval between tests, two transverse fissures were cracked out. One was 60 per cent of the head area and all of the ten were 30 per cent or more. An eight-months interval between tests resulted in one 30 per cent and six 25 per cent fissures, while with the three and four-months intervals, no fissures larger than 20 per cent were found. Such a curve plotted on a tonnage basis rather than elapsed time may be used by the railroads to determine the frequency with which various sections of track should be tested.

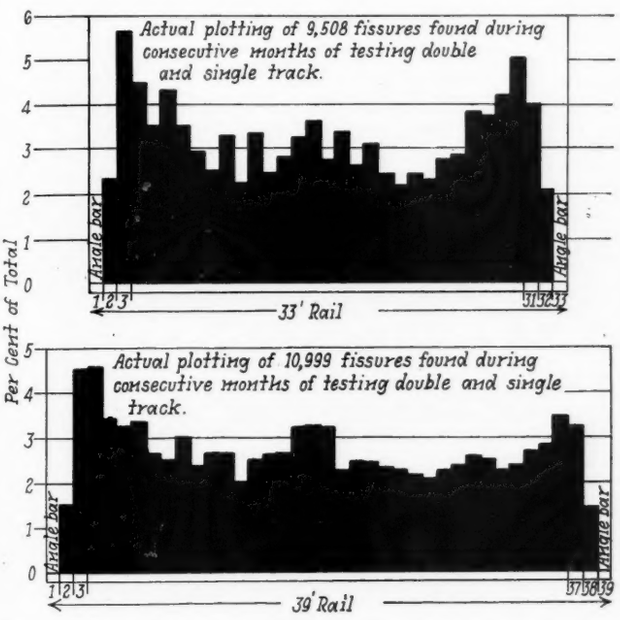

Actual plotting of 9,508 fissures found during consecutive months of testing double and single track.
Per Cent of Total
Angle bar
Angle bar
1 2 3
31 32 33
33' Rail
Actual plotting of 10,999 fissures found during consecutive months of testing double and single track.
Angle bar
Angle bar
1 2 3
37 38 39
39' Rail

Fig. 8—These Charts Show the Predominence of Fissures Near the Ends and Center of the Rail

Frequently, an annual test, such as of double track where there is a preponderance of heavy traffic in one direction, supplies the railroad with approximate data as to the relation between tonnage and fissure development. By plotting the number and size of fissures found for the two tracks on a basis of tonnage between tests, the engineer maintenance of way can arrive at an approximate figure as to fissure growth per million tons.

During the last ten years more than 100,000 potential hazards in the form of fissured rails have been removed from track as a result of detector car testing and, no doubt, serious train derailments have thus been avoided. With heavier axle loads, increased traffic and continually increasing train speeds, the detection and removal of rail failures in their early stages will continue to occupy an important place in the safety program of the American railways.

Turns X-ray on Truck Propaganda

A MUCH-needed debunking analysis of propaganda issued by the National Highway Users' Conference, truckers' groups, petroleum interests and certain manufacturers of highway equipment has been furnished by Dr. C. S. Duncan, economist of the Association of American Railroads, in a timely booklet "The Answer to Highway Propaganda," recently made available for free distribution. Noting in the introduction that the so-called "Conference" gets its chief support from interests which "have no direction with, or responsibility for, transportation service by highway," the writer proceeds to take up the specific tall assertions and misstatements of fact to be found in various pamphlets issued by that body and the American Trucking Associations in "Let 'Em Roll," "The Open Road," and various other such "literature."

These special pleaders charge that the railroads have not held to the principles agreed upon by the Joint Committee of Railroad and Highway Users in 1932. Have the highway interests done so? One of the agreements was that commercial highway users should be regulated; yet, as Dr. Duncan points out, the Conference, through state affiliates, opposed the New York regulatory bill (finally passed in 1938) and are accredited with the successful opposition of every attempt to pass such a bill in New Jersey, the only state which fails to regulate motor carriers. It was unanimously agreed that merchant truckers should be regulated; the Highway Users have since opposed all business' efforts for such regulation. It was unanimously agreed that licenses for out-of-state commercial vehicles should be issued "at equitable rates"; the Highway Users now sponsor "free reciprocity," and boast of their success. It was unanimously agreed that railroads should have equal opportunity to operate highway vehicles; despite this, a provision was inserted in the Motor Carrier Act which forces the Commission to discriminate against the railroads.

What of the claim that the railroads have been heavily subsidized by land grants? Dr. Duncan answers that the 10-million-dollar rate reduction which land-grant railroads annually grant to the government would enable them in annual installments to purchase the entire acreage granted in 12¼ years.

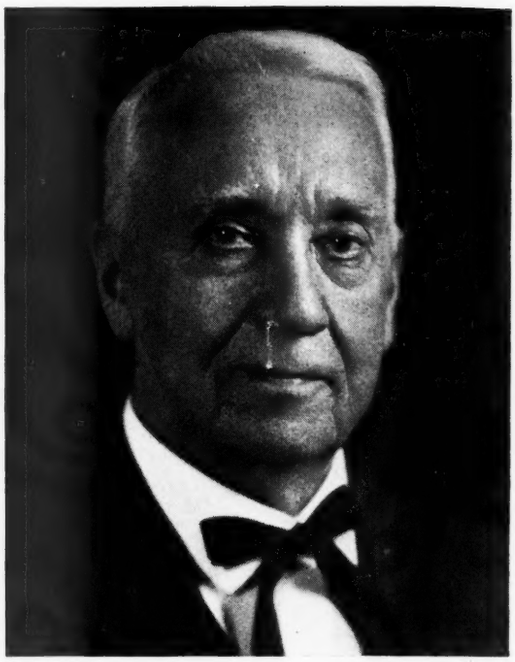
As for the companion claim that motor trucks are not only not subsidized but pay more than their fair share of highway costs, the pamphlet looks at the record. "The truckers themselves say nothing about the fact that they have been given a right-of-way valued, as of 1919, for rural highways at 850 millions of dollars. They say nothing of the fact that they have moved onto the highways existing at the time that their development began for which they paid nothing, and they say nothing of the fact that, in addition to this vast subsidy, the highways have received an additional subsidy of 13 billions of dollars for improvement and maintenance since 1920.

"The truckers claim that there has been no subsidy to

(*Continued on page 294*)

S. M. Vauclain Passes at 83

Baldwin locomotive executive served industry 57 years; stressed individual effort



Samuel M. Vauclain

SAMUEL Matthews Vauclain, chairman of the board of The Baldwin Locomotive Works since 1929 and associated with that organization since 1883, died of heart disease at his home in Rosemont, Pa., on February 4, at the age of 83, after a lingering illness. For the railroad industry his death means the end of a life of which all but 17 of its 83 years were devoted to the design, manufacture and sale of the materials which constitute the very essence of railroading —good locomotives—about 60,000 of them. For the country at large his passing represents in a sense the departure of one of the last and most colorful exponents of personal management in industry.

"Sam" Vauclain grew up in one of the country's "railroadingest" towns — Altoona, shop center of the Pennsylvania and at that time just coming into the bloom of civilization with the erection of the famous Logan House. He spent his early days about the roundhouse and yards and often listened to his father, Andrew Vauclain, tell of his earlier days spent in association with Matthias W. Baldwin in assembling "Old Ironsides," first Baldwin standard product, back in '32. So conditioned, he spent the rest of his life close to railroad motive power, as did his father before him.

Mr. Vauclain had many talents but the foundation of his career was undoubtedly his uncanny ability as a machinist and practical engineer who knew steam locomotives and shop practice "from A to Izzard." Never given to theorizing or isolated study (he forewent college because after four years it would take too much time "to catch up with progress"), he was chiefly a "chalk-and-blackboard engineer" who carried the figures in his head and quoted bids on demand.

Mr. Vauclain's best-known contribution to railroading as a technician was undoubtedly his four-cylinder compound locomotive, first tested in 1891. But probably more important to the industry were his tireless efforts to improve step by step the method and products of locomotive manufacture. Thus shortly after becoming general superintendent of the Baldwin Locomotive Works at the age of 30, he installed the hydraulic forge for making drive-wheel centers, a device known abroad as a theory but unapplied. A few years later he decided to reduce idle time on expensive machine tools and introduced the double-shift to Baldwin's, an industrial principle now universal but unthought of in that day. He was even too progressive for inventors. George Westinghouse once laughed at his friend Sam for suggesting that machine tools be operated as units by electric motors.

During his 57 years' association with Baldwin's, Mr. Vauclain had in some degree to do with the design and production of many "locomotives of the future." Among the successive innovations turned out during the Vauclain era were the first "decapod" heavy freight engine for the Dom Pedro II road of Brazil (1886); the first "wagon-top" boiler for the Denver & Rio Grande and the first "Mikado" for the Nippon railway named for the Japanese Mikado (1897).

Friends of Mr. Vauclain have always marveled at his capacity for long and uninterrupted labor. During most of his active career he slept but 5 or 6 hours a day, spent most of the remainder on the job and when occasion demanded displayed almost superhuman ability to disregard any routine of food and rest. The late E. A. Custer, who was associated with Mr. Vauclain during the hectic days of experimentation with the Vauclain Compound, describes an intense period in his autobiography, "No Royal Road." "Sam" worked Saturdays and Sundays, day and night; together he and Custer labored 118 hours the first week and 120 the second and all that saved Custer from 'solid day-and-night the third week was a fall into the roundhouse pit." When the old girl was ready for road trial "I slept on the coal pile in the tender, ate ham sandwiches and raisin pies and washed in a bucket of water blue with the soap and dirt of many lavings." After an all-day test to Baltimore, they reached Philadelphia—at 4 a. m. Sam declared: "We will go home for breakfast. You don't have to wash up, nobody will be out of bed. Then you come back and go over that compound from back bumper to smoke stack. I'll send a gang to you at

seven o'clock. Go over the valves, set the pops—they are off a few pounds, get her hot and set up the wedges —oh, hell, you know what to do."

Such endurance stemmed from boundless good health in a body of giant proportions. It is said that Mr. Vauclain paid a doctor a flat fee each year ($10,000 in his elder years) to keep him from illness. One of the best tales in Mr. Vauclain's autobiography "Steaming Up!" is that of his demonstration of the compound locomotive "Columbia" on the Milwaukee one cold winter day in a time competition with the English-built "James Toleman." Everything was going well until the right main-pin ran hot. To prevent the delay of slow running, Vauclain attached a hose to the tender and, in sub-zero temperature, clung to the running board and played water on the pin while the engineer did 70 m.p.h. Incidentally, years later, as a locomotive salesman, the Baldwin executive capitalized on this event, when President Barr of the Norfolk & Western gave him a large order principally because, as a former Milwaukee superintendent, he had stood on the station platform at Rondout, Ill., and seen—rather, felt—the compound go by with its designer hanging over the pin. At that time he decided "that a man who'd risk his life to protect the reputation of his locomotives would get my business if ever I had a chance to give it to him."

Samuel Vauclain not only made locomotives; he was one of their most successful merchandisers. This *modus operandi* was based on the belief that "a sale is not completed until the buyer is satisfied." He generally went along with new locomotives to make certain of their satisfactory operation. Hence the "Columbia" episode. Hence his perseverance with a rack locomotive for service on Pike's Peak, the successful installation of which required that Vauclain drive the s.m.p. off the property, which he did and collected his $70,000 purchase money in the bargain. An innate sense of salesmanship led him to exhibit 16 Baldwin engines at the Columbian Exposition of 1893, including his pride, the "Columbia." It enabled him to convince even the street railway industry that Baldwin steam "motors" were better than mules, in spite of countless city ordinances and traditional conservatism.

When times were dull, Mr. Vauclain either looked to foreign fields "where commercial skies were brighter" or pepped up the domestic market with new ideas. Thus he early extended the market for Philadelphia-built locomotives to wherever ties held rails apart. Success in these ventures depended first upon his ability to convince foreign operators—often untrained politicians —that they needed Baldwin locomotives and, second, upon his faith in their honesty and ability to pay. Poland decorated him with its highest honor, the "Polonia Restituta," in 1923 for his contribution to the rebuilding of the new republic out of the wreckage of war and for his faith that the penurious state would some day pay the bill for 150 locomotives. And Roumanians won't soon forget the deal he made with Queen Marie, "the country's best business man," by which he sold $15,000,000 worth of locomotives and machinery payable in 60 monthly installments in cash or oil. The oil he sold to the British government at a handsome profit. Typical of his tactics on the home front was the so-called "Prosperity Special," a consignment of 50 heavy freight locomotives (cost $5,000,000) which he had hauled as a solid train across the continent for delivery to the Southern Pacific. This colorful 3,743-mile parade was Vauclain's way of attacking the depression of 1922.

Samuel M. Vauclain was born in Philadelphia, Pa., on May 18, 1856. Shortly thereafter his father, who had been in the employ of Matthias W. Baldwin (founder of The Baldwin Locomotive Works) and of the Philadelphia & Reading, entered the service of the Pennsylvania and moved to Altoona, Pa., where the shops of that road were then under construction. The boy was educated at the Altoona public schools and at the age of 16 entered the employ of the Pennsylvania. At 21, his apprenticeship completed, he was made a foreman in the frame shop.

In 1882, Mr. Vauclain was sent to The Baldwin Locomotive Works to inspect the construction of locomotives then being built for the Pennsylvania. As a result of this trip, he was offered a position with the Works and on July 1, 1883, entered their employ as superintendent of the Seventeenth Street Shops. In 1886, at the age of 30, he was made general superintendent of the plant, and in 1896 became a member of the firm of Burnham, Williams & Co., proprietors of the Works.

In 1911, Mr. Vauclain was made vice-president of The Baldwin Locomotive Works, the company having been incorporated two years previously. He was appointed senior vice-president in 1917, and president in 1919. Ten years later, in 1929, Mr. Vauclain relinquished the presidency to George H. Houston and himself was elected chairman of the board, in which position he remained until his death.

During the World War, Mr. Vauclain served as chairman of the Locomotive and Car Committee on the Council of National Defense, and also as chairman of the Special Advisory Committee on Plants and Munitions of the War Industries Board. It was during this period that he directed the supply of locomotives and munitions for participating countries and under his general direction a plant was built at Eddystone, Pa., for the manufacture of rifles. With the entrance of the United States into the World War, the entire facilities of The Baldwin Locomotive Works were placed at the disposal of the United States Government, and large orders for locomotives, ammunition and gunmounts filled.

For many years, Mr. Vauclain was a member of the board of a number of banks, insurance and civic organizations and at his death was a director of the Standard Steel Works Company, Baldwin-Southwark Corporation, Whitcomb Locomotive Company, I. P. Morris & DeLaVergne, Inc., The Federal Steel Foundry Company, Cramp Brass & Iron Foundries Co. and The Midvale Company, all Baldwin subsidiaries. He also served on the boards of the Westinghouse Electric & Manufacturing Co., and Westinghouse Electric International Company.

In view of services rendered to his own and foreign governments, Mr. Vauclain was awarded the Distinguished Service Medal by the United States government in 1919; the "Chevalier de la Legion d'Honneur Francaise" by France in 1919; "Il Cancelliere Dell' Ordine Della Corona D'Italia" by Italy in 1920, and the "Polonia Restituta" by the Polish government in 1923. He also received honorary degrees of Doctor of Science from the University of Pennsylvania and Worcester Polytechnic Institute and the degree of Doctor of Laws from Villanova College.

DRIVING A LOCOMOTIVE is a hobby for Major C. T. F. MacKenzie of London, England, and Biggar, Sask. Though a resident and accredited member of the high-toned Carlton Club of London seven months of each year, Major MacKenzie is an active Canadian National locomotive engineer during the remainder. Taking traveling and living expenses into account, he estimates that it costs him $2,000 more than he earns from it each year to "indulge" in railroad work.

Southern Pacific Installs New Daylight Trains

Two new 14-car trains have increased capacity and embody many refinements affording increased passenger convenience and comfort

THE two new 14-car Daylight trains, recently built for the Southern Pacific by the Pullman-Standard Car Manufacturing Company, went into regular service between San Francisco, Cal., and Los Angeles on January 10, replacing two 12-car trains, which were constructed by the same car builder and described in the *Railway Age* of March 13, 1937. The older equipment will be reconditioned in company shops and returned to supplementary San Francisco-Los Angeles service as soon as necessary repair and redecorating work is completed.

The new streamliners, like their predecessors, are hauled by modern streamline steam locomotives. They embody the same general structural design, but include many refinements in interior details which will appeal to the traveling public. The provision of two additional car bodies has permitted increasing the diner seating capacity from 40 to 152 and the total seating capacity from 454 to 639. The principal changes contributing to improved service are the three-unit coffee-shop, kitchen and dining car; fluorescent lighting; luggage elevators; public address system working in conjunction with individual car radios; inter-communicating telephone between kitchen and diner sections; swivel parlor-car chairs with reclining feature; new color scheme; fabrics; Neon rear-end sign; etc. Axle generators are body hung instead of being mounted on the truck frames; rubber tiling replaces linoleum on compartment floors; garbage disposal chutes to containers underneath the cars avoid the necessity of having garbage cans in the kitchen and bar room.

Description of the New Daylights

The consist of each of the two new Daylight trains is identical and includes the following: One combination baggage-chair car, seating 44; one full chair car, seating 44; six chair cars, articulated in units of two, one for men and one for women, seating 46 in each car body; one tavern car, seating 56; one special car consisting of three articulated car bodies, a coffee shop with seats for 80 at the front, an intermediate kitchen and pantry, and a diner with seats for 72 at the rear; one parlor car, seating 27; one parlor-observation car, seating 40.

The car body framing of these new cars is made principally of USS Cor-Ten steel, with Pullman welded truss-type side frames and stainless steel exterior side sheets finished in an attractive wide, orange, red and black stripe color scheme. The underframes are welded throughout, with castings confined for structural utility to the assembly of bolsters and buffers. The truss-type side framing is built of vertical and diagonal pressed-steel members, principally channels, joined by welding. Side sheathing is of stainless steel, corrugated except for the window panels which are flat.

The car floors are insulated with cork and the superstructures with 2 in. of Fiberglas on one train and 2 in. of Stonefelt on the other. Tight-lock couplers with A. A. R. type heads are used at all ends not articulated, except the rear-end observation car which is equipped with a lightweight A. A. R. coupler. Waughmat rubber draft gears are installed. Platform entrances are at one end, only, of each coach and the parlor car, with steps of folding type operating in conjunction with trap doors and invisible when the vestibule doors are in closed position.

At the articulated connections between cars, six-wheel trucks are applied, all other trucks being of the four-wheel type. The four-wheel trucks are triple-bolster while the six-wheel trucks are of the drop-equalizer type. Simplex clasp brakes are arranged with double brake heads, providing four shoes per wheel and four truck-mounted air-brake cylinders per truck. The truck frames are Commonwealth cast steel. Journal boxes, designed for use with Magnus plain bearings, are also of cast steel, made large enough to permit interchangeability

with wide-type roller bearings. Axle journals are A. A. R. standard 6-in. by 11-in. and 6½-in. by 12-in. to suit the varying weights of car ends. Journal lubrication is of the self-contained wick type, developed by the Southern Pacific.

The air brake on the entire train is the latest type of high-speed equipment including the electro-pneumatic feature for controlling the application and release of the air from the brake cylinders in the shortest possible time. Additional brake development is represented in the application of hand brakes throughout the train. While the hand brake is designated as a safety-appliance feature and is usually required to develop only such effort as would effectively hold cars while parked in a coach yard, the installation of hand brakes on this equipment has been designed to develop sufficient effort to control a fully loaded train at what would be considered at the present time as a moderate speed. The application of hand brakes to the three-car dining unit is of special interest, in that successful connection has been made between the car structures and a six-wheel truck under an articulated connection.

All sash are double in one part, with the outer in fixed position, while the inner sash can be swung inward and upward for cleaning purposes. All sash are constructed of aluminum extrusions with rounded corners and left in natural color with a satin finish. They have safety glass on the inside and ¼-in. polished plate glass on outside sash. Dodge Venetian blinds are installed in the tavern car.

All Cars Are Air-Conditioned

All cars are fully air-conditioned, using the Safety steam-jet system, with outlets for cooled air into passenger compartments in the car deck. To facilitate cleaning, the deflection members with lighting troughs attached are hinged to permit ready access to the air duct. The kitchen car, also, is air-conditioned, having a unit of 3½ tons capacity at each end to cool the passageway and pantries. A flexible duct connects each unit to the adjoining car. Vapor steam heat equipment and thermostatic control are installed, the overhead heat operating in conjunction with the cooling system through the cool ducts and outlets. Floor heating utilizes the unit fin-tube system.

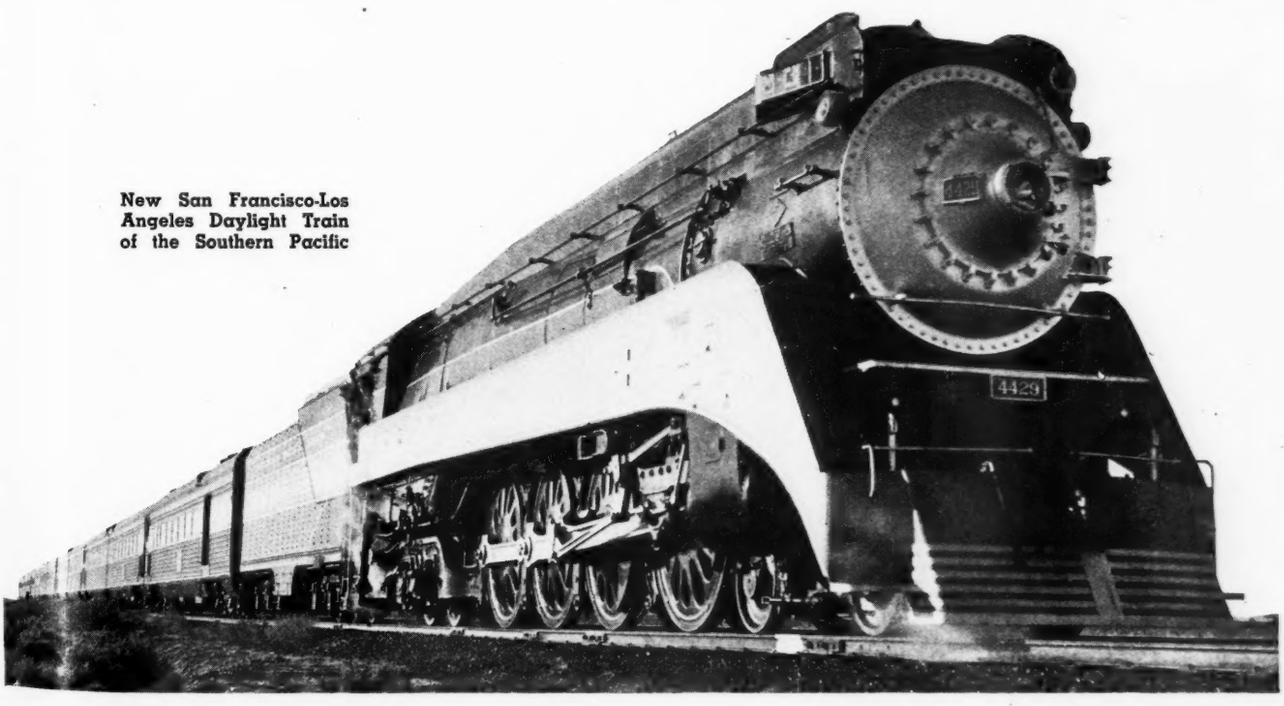
Electrical Features—Lighting

All cars have 10-kw. body-hung generators except the tavern and observation cars which have 15-kw. generators. The drive from truck to generator is of the Spicer automatic type, interchangeable on all cars.

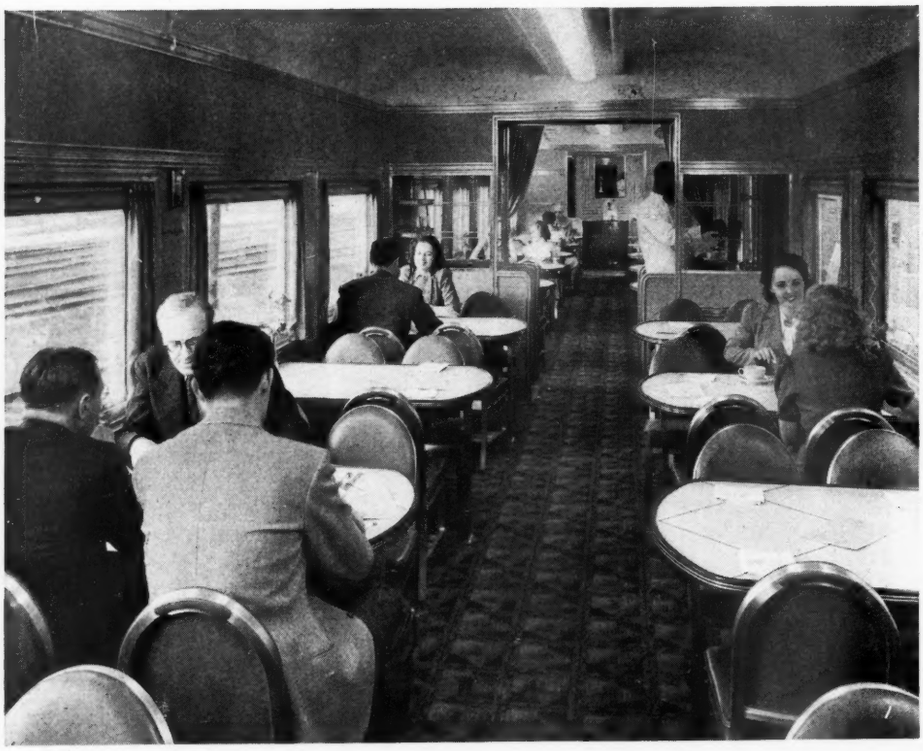
General illumination is obtained by Safety continuous center ceiling fixtures, extending the full length of the passenger compartment. This fixture has 18-in. daylight-type fluorescent lamps rated at 15 watts at 110 volts and furnishing 450 lumens output. Each lamp is equipped with a resonant-type auxiliary unit mounted in the same fixture. The auxiliary units are of two types, one producing a leading power factor and the other a lagging power factor. The leading and lagging auxiliaries are balanced on each circuit to give a unity power factor load on the 110-volt supply. Also, by alternating the leading and lagging power-factor auxiliaries on the same circuit, the stroboscopic effect of the fluorescent lamps is minimized. The fluorescent lamps give a high daylight quality light with relatively low power consumption.

A 32-volt d. c. to 110-volt a. c. 60-cycle motor-alternator, suspended under the car, supplies the power for the fluorescent tubes and auxiliaries. This set is rated at 2,000 volt-amperes. A starting and control panel maintains the speed of the motor-generator set within limits, regardless of the battery or main generator voltage. This starting contactor for the d. c. motor is wired through one pole of the double-pole circuit-breaker switch for each fluorescent light circuit, therefore any one of the circuit switches will start the motor generator. The second pole of the circuit switch is used to break one side of the a. c. circuit to the lamps.

The incandescent lighting over the semi-circular bar in the tavern car is arranged in three-circuits, one circuit has canary yellow lamps, one red and amber lamps and the third blue and amber. These three circuits are each connected to a resistor drum on a motor-operated color-



New San Francisco-Los Angeles Daylight Train of the Southern Pacific



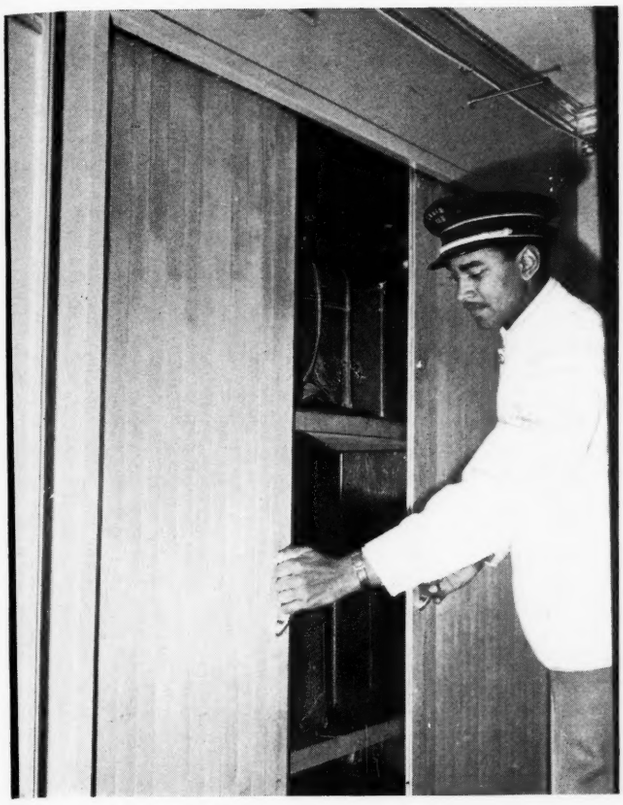
Left: Coffee-Shop Section of the Three-Unit Articulated Coffee-Shop, Kitchen, Dining Car—Below Left: Dining Room of the Three-Unit Articulated Car—Below Right: The Parlor-Observation Car Seen from the Observation Room at the Rear

control device. The circuits are so connected that, as the drums revolve, the light, through various combinations of the four colors, changes through all the colors and shades of the spectrum. The color-cycle dimmer and lighting circuits are controlled by a small switchboard in the color-control locker opposite the main switchboard locker.

The radio and public-address systems in each train are independent units; however, the arrangement is such that the radio speakers are silenced whenever it is desired to use the public address system.

Each car in the train, except the kitchen car, has two radio speakers—one located at each end of the main body of the car. Individual control of each is obtained by means of a constant-impedance volume control, located near the speaker. Each speaker is connected through its volume control to a trainline terminating at each end in a receptacle. This trainline is shielded from all electrical interference by running in its own individual conduit. Connectors between cars are four-conductor molded-rubber cords and plugs. There are four radio sets in the train, one in each of the following cars: Chair-baggage car, articulated chair with mens lounge, tavern car and parlor-observation car. The output of each set is connected to the radio trainline in its respective car. Radio sets are of a type developed especially for railway service. Power for radio is supplied by a 250-watt, 32-volt d. c. to 100-volt a. c. rotary converter located under the car. The starting and stopping of the converter is controlled directly by the Off-On switch on the radio chassis.

An entirely new feature of these trains is the pro-



vision of an elevator luggage compartment at the entrance end of each parlor and chair car. Instead of taking suitcases and other passenger luggage into the car in the conventional way through the end door, this baggage can be placed on shelves in a luggage compartment from the outside of car and later raised to transit position in a compartment which is accessible from inside the car, using an ingenious design of Dodge roller-type door constructed of aluminum.

Each compartment has two shelves which are raised and lowered by four motor-driven screws, one located in each corner. The operation of the shelves and the outside door is controlled from a push-button station on the outside of the car. There are four buttons: "Door up," "Door down," "Shelves up," "Shelves down." The button must be kept depressed until the particular operation is completed. Protection is obtained with limit switches. In transit, the main motor-supply breakers are shut off inside the car to prevent movement of the elevator. If the outside door should be left open by mistake, a red light shows inside the car and the porter may lower the door by depressing a Door down button located inside the car adjacent to the red light. The luggage loader may also be operated by a hand crank.

For the disposal of garbage in pantries and in the bar, a specially-constructed compartment has been developed by the car builder in collaboration with the railway, the refuse being delivered through a chute to a chamber underneath the car from which it is removed with a

Above Left: Dodge Roller-Type Aluminum Doors Close the Luggage-Elevator Compartment Inside the Car—Above Right: The Luggage Elevator, Electrically Operated from Outside the Car, Eliminates Congestion in Vestibules at Terminals — Right: In the Tavern Car Looking Towards the Bar

dumping device into containers at terminals or intermediate points, thus eliminating the necessity of entering the cars for this servicing.

Another convenience, installed in the triple-unit dining car, is a telephone between the kitchen and the other two cars which permits intercommunication between

Interior Appointments in One of the Chair Cars

members of the car crew and obviously promotes faster service on this exceptionally-large unit.

Practically all kitchen and pantry equipment is made of Monel metal. A large range and two steam tables are installed. The former has a full complement of equipment such as broilers, bread toaster and egg timer. Throughout the kitchen and both pantries the Monel floors are constructed so as to form one pan on which all the equipment is placed, thus fully protecting the underframe structure and underneath equipment by minimizing the drainage outlets.

Chair cars have Heywood-Wakefield twin reclining revolving chairs with bright chrome-finish tubular structural members. Parlor cars have General Fireproofing revolving, reclining, single-seat chairs with framework constructed of satin-finish aluminum tubes. All chairs in the lounge rooms and observation rooms are likewise constructed of aluminum. Sponge rubber is used in all chair and soft cushions.

The last car in the train has an oval end forming the observation room and giving full vision to the rear. On the hood is a streamlined back-up light. Built into the rear door is a flush tail sign, having the special insignia of this train illuminated with a Neon sign. Special accommodations in this car include a modern writing desk, magazine tables, table lamps and provision for connection with the local telephone at terminal stations.

Interior Decoration Treatment

The new Daylight trains retain the same basic architecture as the original trains but particular emphasis has been placed on color, and special new colors, developed by the Pullman-Standard color and design department, correlate more closely the colors of the train with the country and natural setting through which it will operate. A close tie has been established between native colors and the decorative colors used on the trains. Some of the new shades of colors developed are the blues in which aquamarine, Pacific blue, and horizon blue recall the colors of the Pacific, and the clear intensity typical of California skies. Other colors developed are sea-foam, palm green, mist gray, sunlight yellow, mission tan, peach glow, etc.

A simple modern type of architecture is used throughout all of the cars and special emphasis is placed on window treatment. The windows themselves are one of the outstanding features as they are long, giving a maximum of visibility and creating a definite horizontal line effect on the car interiors. This effect is further heightened by the use of satin-finish aluminum molding, running the full length of the car above and below the windows, and by complete framing of each window by satin-finish moldings. The effect striven for is to make each window a picture frame through which the occupants can view constantly changing pictures as the terrain of the country changes during the trip.

Basket racks have been given minimum emphasis in painting and by making them part of the car structure rather than applying them separately. Over each seat a spotray light, arranged for individual control, is placed on the bottom of the basket rack, giving each coach seat individual lighting. Satin-finish louvres, extending the length of the car, are in the bottom of the basket racks. These enable passengers to see parcels and packages after they have been placed in the rack. The fluorescent ceiling light, forming a continuous strip unbroken by moldings from one bulkhead to the other, adapts itself to the style of architecture and becomes part of the interior, both from the appearance and the architectural standpoint and does not have the effect of an applied fixture.

One of the Four-Wheel Trucks

S. 2009 Conferees at Work

Reveal agreement on language for "fourth section"; get more memoranda from various interested parties

WASHINGTON, D. C.

MAKING the first specific announcement in connection with their deliberations, conferees on S. 2009, the omnibus transportation bill, revealed on Wednesday that they had agreed upon language for a "fourth section" which will emerge without the equi-distant clause, with remaining provisions applicable to water carriers as well as railroads and with a proviso similar, though with some changes in the wording, to that put into the Senate version by Senator Reed, Republican of Kansas, for the purpose of expediting fourth-section procedures. Responding to inquiries as to the progress of the deliberations one of the conferees estimated that about one-fifth of the matter covered in the bills had been considered; estimates of the time it would take to complete work on the conference report ran from Senator Wheeler's "about ten more days" to guesses of House conferees, including Chairman Lea, who thought they would be at it for another two weeks, while another talked of "the first of March—maybe longer."

Chairman Wheeler of the Senate committee on interstate commerce is acting as spokesman for the conference committee. Following the first meeting on February 1 he said that there would be no day-to-day announcements of tentative agreements on various provisions; also, that the conference committee would hold no public hearings. Mr. Wheeler also revealed at that time that no effort would be made at the outset to reach an agreement on the form which the final bill should take, i.e., whether to adopt the Senate's idea of codifying the Interstate Commerce Act or the House's plan of embodying the new legislation in amendments to the present act including a Part III for the regulation of water carriers.

The New "Fourth Section"

The aforementioned agreement on a "fourth section" (it is section 50 in the Senate bill), of course, leaves the long-and-short-haul clause in the law; also, it leaves in that provision whereby rail rates once reduced to meet water competition cannot again be increased without a showing of changed conditions other than the elimination of the water competition. As noted above, the language agreed upon would make the section applicable to water carriers, but motor carriers would remain out from under it. The elimination of the equi-distant clause may be expected to satisfy everybody; even the I. C. C. wants to get rid of it.

The Reed proviso for expediting fourth-section procedures stipulates that railroads seeking fourth-section relief may file tariffs proposing the rates sought at the same time the application for the relief is filed. Thus if the relief is granted the rates would become effective without delay. The change which the conferees made in the proviso before accepting it embodied language agreed upon by the state commissions of Idaho, New Mexico, North Dakota and Arizona; it provides specifically that the tariffs filed shall not become effective until the commission has approved the application for relief, after which the rates can go in on one-day's notice.

Meanwhile the conferees have continued to receive much and varied advice, including the 149-page report from the Interstate Commerce Commission's legislative committee which was made public last Thursday and noted briefly in the *Railway Age* of February 3, page 260. From American Trucking Associations, Inc., has come a 31-page memorandum wherein that organization has set forth its objections and suggestions. A. T. A. requested "special consideration" of three points "of vital interest to the trucking industry." These points relate to the desire of A. T. A. to bring hours of service of all motor carrier employees under I. C. C. jurisdiction; to prevent the Railway Express Agency from getting any new exemptions from regulation under the Motor Carrier Act; and to write into law a stipulation that all traffic handled by a railroad-owned or operated truck line shall move partially by railroad and only to or from towns served by the railroad.

The report of the I. C. C. legislative committee is in the main a section-by-section review of the Senate bill with comment on corresponding provisions of the House bill and a separate discussion of House-bill provisions not found in the Senate bill. As noted in last week's issue, the commission's general suggestion was that under present conditions it would be better to adopt the uncodified form of the House bill, "confining it to matters of principal importance." The commission directed the conferees attention "especially" to its discussion of amendments with respect to casual or occasional transportation by motor vehicle; exemption of motor carrier operations within a single state; organization and procedure of the commission; elimination of prohibition against short-hauling in establishment of through routes; provision governing rate reductions (the so-called Wadsworth-Miller amendment); hours of service of motor carrier employees; provisions with respect to certificates and permits of motor carriers; protection of employees in connection with unifications; provisions of the present "fourth section."

In connection with casual or occasional transportation by motor vehicle the commission wants provisions which will remove its "present inability to accomplish any effectual results in the regulation of so-called travel bureaus; and it objects to the form of proposals to exempt intrastate motor operations, contending that the "sound procedure is clearly to preserve jurisdiction under the act until grounds for exemptions have been shown, rather than to reverse this process, as is proposed." With respect to its own organization and procedure the commission suggests various changes in the provisions dealing with such matters. It approves the provisions of the so-called through routes bill as embodied in the Senate version; but it opposes the inclusion of the so-called Miller-Wadsworth amendment and it wants its authority over hours of service of motor carrier employees limited to those workers whose activities affect safety of operations, i. e., drivers only. The commission is opposed to the Harrington "labor-protection" amendment in the section dealing with railroad consolidations; and it favors the elimination of the "equi-distant" clause from the "fourth section," although it does not believe that motor carriers for the present should be made subject to the remaining provisions of that section. Al-

though it did not list its comment thereon among the "especiallies," the commission is opposed to the so-called Jones amendment in the House bill which would require the prescription of export rates on agricultural products on substantially the same relative basis as the railroads are now permitted to publish export rates on manufactured articles.

Wants Policy Declaration Mollified

As pointed out in last week's issue the changes suggested in the commission's report are classified as important, desirable or debatable. "Important," the commission thinks, are changes in the declaration of policy, because the present one is "too strong a statement." It would alter the reference to a transportation system "adequate at all times to meet the full needs of the commerce of the United States, of the Postal Service, and of the national defense." In the event of war, the commission suggests, the railroads could hardly be expected to meet the "full needs" of the "national defense," and many such needs would be supplied by the military forces with their own facilities. Thus it suggests that the phrase be changed to read "properly adapted to the needs of the commerce . . ." Also, the commission thinks it might be desirable to omit the declaration's reference to "safe" transportation, since the bill gives it jurisdiction over matters affecting safety with respect to only the railroads (in part) and the motor carriers. "Only window dressing" is what the commission calls the declaration's reference to "fair wages and equitable working conditions established through collective bargaining"—because the bill gives it no jurisdiction over wages or working conditions as such. It would eliminate the reference; but it favors the additional sentence in the House bill's declaration which calls for administration of all provisions "with a view to carrying out the above declaration of policy."

Having got along since 1914 without a definition of "express company," the commission suggests that it might make out on that basis for a while longer. In any event it thinks that the Senate bill's definition of an express company as a common carrier engaged in the "express business" is "practically meaningless." The commission does not now propose provisions giving it authority to require the establishment of through routes between rail and motor carriers, despite its belief that "it would be better to make the establishment of reasonable through routes between all common carriers a duty without exception." With respect to the filing of schedules by contract carriers, "there are differences of opinion within the commission" but the report undertook to reflect the "prevailing view." Among other things in that connection it suggested provisions to require that schedules filed by contract carriers shall give minimum charges "actually maintained and charged," since the present provisions permit the filing of minimum charges "which are fictitious."

Should "Commodities Clause" Be Extended?

Present provisions relating to "free and reduced rate transportation," the commission thinks, "are, if anything, unduly liberal;" and it questions "some of the extensions" proposed in the bill. With respect to pooling the commission recalls that it is on record "in favor of power to compel pooling of traffic and earnings, regardless of the assent of the carriers involved." It thinks that there is "serious question" whether the commodities clause should not be extended to all common carriers, but it understands that it is the thought of Congress that this question should be left for subsequent consideration. Also, "while it may prove desirable to give shippers the right to route shipments by motor and water carriers we do not now recommend such an extension of this right."

Next the report includes a suggested provision covering the matter of consolidated system reports; this is considered desirable because "some question has been raised as to the authority of the commission to require such reports." Assuming that the committees have heard the shippers and carriers on the question of limitation periods for the beginning of actions for recovery of charges, damages and overcharges, the commission is content to leave the matter with the conferees. It has no criticism of the section dealing with commission salaries, although it does point out that the bill, like the present law, names a salary of $12,000 a year, while terms of appropriation bills have for several years limited the amount paid to $10,000. "The salary of $12,000 should not be named in this act, unless Congress means to pay that salary," the report says. "Otherwise the Congress will not be acting in good faith." Meanwhile the commission recommends that the salary of its secretary be increased from $9,000 to $10,000.

"Pure window dressing" are the words which the commission had for the provision setting forth the right of labor to intervene in cases before it. "The commission has never refused to hear representatives of carrier employees in any proceeding where they wish to be heard, and there is no danger that it will ever refuse," the report added. After next setting forth in turn its objections to the Miller-Wadsworth amendment and its desire to be specifically relieved of jurisdiction over hours of service of non-driver motor carrier employees, the commission said it had no objection to the provision calling for a speeding up of its investigation of the need for federal regulation of the sizes and weights of motor vehicles; but "as a matter of fact every effort possible with our present staff and appropriation is being made to expedite this investigation."

Would "Out-the-Window" Harrington Amendment

In suggesting that the Harrington "labor-protection" amendment goes "much too far," the commission goes on to say that if railroads are prevented from conducting their operations with economy and efficiency, the result will be "continuing loss of employment" among railway workers. Certain revisions in the penalty provisions are suggested as the commission continues to assert its belief that it would be "a fatal error" in any wise to disrupt the Elkins Act and thereby lose the benefit of the numerous court decisions thereunder. It warns that provisions in the two bills calling for investigations of interterritorial rates may call for probes "so large as to get out of hand," and if such provisions are to be retained it would eliminate references to rates on raw materials and agricultural products.

As noted in previous pronouncements, the commission thinks a broader assignment and longer life should be given to the temporary study board which the Senate bill would set up to investigate the relative economy of the various agencies of transportation and government aids to transport. It does not otherwise object to this provision, but calls attention to the fact that the members "are to be appointed by the President without the usual advice and consent of the Senate."

Dealing with the House bill's proposal to bring forwarders under regulation by adding them to the list of carriers subject to Part I, the commission refers to its own divided house on whether forwarders should be regulated at this time. However, it adds, that if there

is to be regulation it calls for "more elaborate provisions" than those of the House bill.

The so-called bridge bill, which got a Presidential veto when it passed as a separate measure last year, "imposes no duty on the commission, and we have no special knowledge which would particularly qualify us to express an opinion on its provisions." The House bill embodies the provisions of this measure which is designed to provide relief for railroads with respect to the cost of reconstructing bridges required to be altered in connection with waterway improvements. Provisions for conditional repeal of land-grant rates are "in accord with past recommendations of the commission;" but "we do not believe that the existing statutory standards, under which the commission determines whether or not to approve loans by the Reconstruction Finance Corporation to railroads, should be changed" as proposed in the House bill.

Some More Weighty Opinion by Truckers

Aside from the above-mentioned matters with respect to which A. T. A. requested "special consideration," the memorandum from that organization discussed various other provisions of the two bills. Among other things it complains of the failure to give the I. C. C. authority to require joint rail-motor rates. To A. T. A. it seems "idle to write a declaration of policy directing the commission to develop a national transportation system and then fail to give the commission general jurisdiction over through routes and joint rates." Next, it appears, the trucking industry wants no "labor-protection" nonsense; because "unemployment or displacement of workers in connection with consolidations is a problem peculiar to railroads, and has no relation to the trucking industry."

With respect to the regulation of forwarders, the A. T. A. thinks it is "most important" that Congress retain the provisions of the House bill. It concedes that more complete regulation of forwarders may be desirable, but it nevertheless wants the House bill's provisions retained pending further legislation. Since the commission's decisions in the Acme case and in the Freight Forwarding Investigation, holding that the consolidators are subject to neither Part I nor Part II, the A. T. A. says, "innumerable fly-by-night forwarding operations have sprung up in all parts of the country." On the matter of reparations, the trucking industry wants to be left where it is, i. e., without such provisions applying to it. With respect to the Miller-Wadsworth amendment, A. T. A. suggests the addition of a proviso "to preserve the benefits and avoid the evils." If it doesn't get the proviso in, it believes that the amendment should be eliminated.

Next the trucking association renews its "request for action" on the question of sizes and weights of motor vehicles. It goes on to suggest an amendment to the bill which would give the I. C. C. power, upon complaint, and after a hearing to over-ride state regulations and prescribe regulations consistent, among other things, with "the free flow of interstate commerce." Contracts of contract carriers is a subject "potentially controversial" between the Common and Contract Carrier divisions of A. T. A.; but they got together on a recommendation which is set forth in the memorandum. With respect to the commodities clause, A. T. A. is aware of no abuses calling for the application of that provision to the trucking industry.

Among other memoranda received by the conferees was that submitted on behalf of the National Association of Railroad and Utilities Commissioners by that organization's general solicitor—John E. Benton. This memorandum was in the main a setting forth of the position of the state commissions with respect to provisions under which motor carriers operating solely within one state may be excepted from federal regulation. Still another memorandum was a joint effort of the Southern Traffic League and the North Carolina Traffic League.

The Transportation Association of America has also given the conferees a memorandum of its views on proposed legislation copies of which, as is announced in the news pages herein, are available for free distribution.

B. of R. T. Wants to Keep Harrington Amendment

Representative Alexander, Republican of Minnesota, inserted in the appendix to the February 6 Congressional Record a letter wherein he had been called upon by G. T. Lindsten, chairman of the Minnesota Legislative Board, Brotherhood of Railroad Trainmen, to support the Harrington "labor-protection" amendment. Mr. Lindsten also sent along a copy of a letter previously sent in the same connection by B. of R. T. President A. F. Whitney to each of the conferees. "Without protection of the Harrington amendment," Mr. Lindsten told Representative Alexander, "it is expected that 200,000 railroad workers will lose their jobs." The same figure appears in the Whitney letter which calls it "a slander on the intelligence of railway workers to assume that they would accept such weak and meaningless language" as the Senate bill's general provision that the I. C. C. shall have authority to condition its approval of mergers upon provisions for the protection of the workers affected. In Mr. Whitney's opinion "it would be far better for the country and for railroad workers" if the conferees reported no recommendations than if they agreed on a conference report without the Harrington amendment. In developing the argument in support of his contention that the bill contemplated widespread consolidations, Mr. Whitney cited several statements made by George M. Harrison, chairman of the Railway Labor Executives' Association, who was one of the labor members of the committee-of-six.

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Courtesy Official Information Bureau of Switzerland

Through Express Passenger Train of Lightweight Steel Cars on the Swiss Federal Railways About To "Leave Town"

Railroading at Army Maneuvers

Supply operations at Plattsburg demonstrate advantages of railroad service

By Southworth Lancaster*
Division Freight Agent, Boston & Albany

"STANDARD gage railways are the backbone of the military supply system." (General Staff Doctrine.)

At the First Army maneuvers at Plattsburg, N. Y., in August, 1939, the principal supply problem was the distribution of rations to 52,000 troops in an area of about 400 sq. mi. It was decided that this problem could be solved only by railroad transportation and the facilities of the Delaware & Hudson, which serves the territory, were therefore called upon. To date, there have been few such instances when the Army has been able to put into actual operation a rail-based supply system, and because the Plattsburg operations illustrate on a small scale the basic methods of supplying an army in the field, they are receiving attention from military authorities, and deserve attention from railroad men generally.

The Successive Steps in Supply

The channel of supply for an army, as developed in France during the late war and little changed today, comprises the base depot, regulating station and railhead, in order from rear to front. The base depots (there may be several) load trains to the regulating station, which is practically a classification yard. From this point, so-called "daily trains" are made up and despatched to the various railheads in the combat area for delivery to troops. The number of depots and other installations obviously depends on the size of the army and the extent of territory covered. Owing to the limited territory and the short duration of the maneuver period, the operation at Plattsburg was somewhat condensed.

A supply depot was established at Plattsburg barracks, subdivided into a Storage & Issue division and a Regulating division. The Storage & Issue division operated the supply warehouse and functioned practically as a base depot. The warehouse was run much like an outbound freight house, under a warehouse officer who corresponded roughly to a railroad freight agent, except that he had no authority over the movement of cars. It was possible to stock the warehouse with non-perishable items before the maneuver began, thus reducing the inbound car movement during the maneuver period and allowing the warehouse to concentrate on the loading of cars.

One box car per day was loaded to each railhead. Empties placarded with the name and location of their railhead destinations were spotted at the warehouse in destination order, so that when loaded they were ready for train movement without additional station switching. On completion of loading, the cars were released to the Regulating division for movement to the railheads; at that moment the warehouse ceased to be a base depot and became a regulating station.

The Regulating division was charged with the movement of the "daily train" and the operation of the railheads, under a regulating officer, whose job corresponds

* The author, commissioned Major, Field Artillery Reserve, served as Transportation Officer, Quartermaster Corps, during the period of maneuvers.

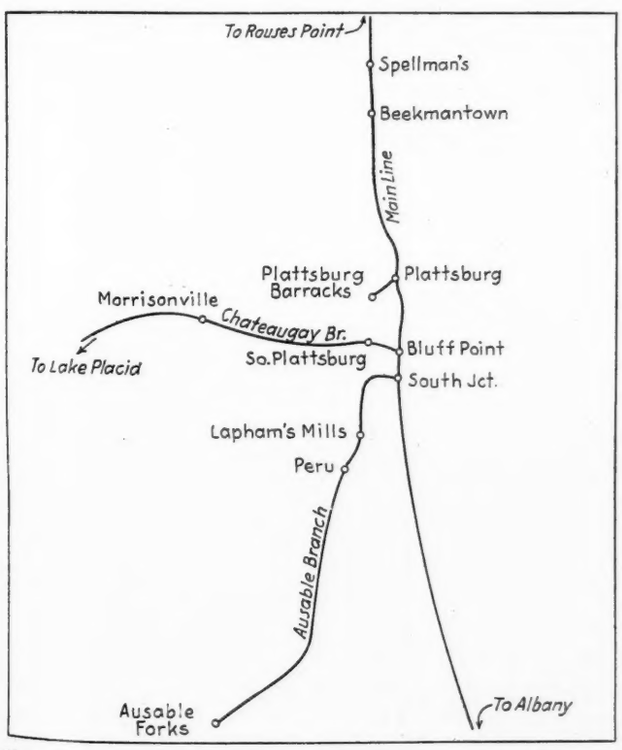
This View of the Railhead at Ausable Forks Shows the Freight Station and Special Cars Spotted For Use by the Army

roughly to that of division superintendent. The similarity depends, however, somewhat on whether the rail system is run by civilians or as a military railroad. In the Plattsburg maneuvers, the regulating officer kept only a general oversight of train operation and concerned himself principally with the supervision of the railheads, or what might be called station service. His assistant, the transportation officer, was in direct charge of train movement, being part yardmaster, part trainmaster and part industrial traffic manager.

As indicated on the accompanying map, there were five railheads—at Beekmantown on the D. & H. main line, South Plattsburg and Morrisonville on the Chateaugay branch, and Peru and Ausable Forks on the Ausable branch. The first four served one division each, averaging about 9,600 men, while the Ausable Forks railhead served a corps of about 13,000. Each railhead had its own operating force, called the railhead detachment, under a railhead officer who corresponded to a local station agent. The railhead detachment unloaded the car dropped by the daily train and made distribution of the rations to the various troop units who called for their own items in the same manner as a consignee takes delivery of his freight.

A railhead, in its simplest form, is merely an accessible delivery track. However, covered storage space is used where possible. At South Plattsburg and at Ausable Forks this was furnished by tents. To protect perishable items, a refrigerator car was kept at each railhead and iced daily for storage purposes throughout the maneuver. It is the writer's opinion that one such "reefer" should be furnished for each 9,000 men.

In addition to the railheads, there were maintained two water supply points, serving troops which could not use other facilities,—one at Spellmans, on the main line for the Beekmantown troops, and one at Laphams Mills for the Peru division. Three 8,000-gal. tank cars were shipped daily to each point from Plattsburg barracks, furnishing a total of 48,000 gal. of water in six cars.



Map Shows Lines of the D. & H. Serving the Plattsburg Army Maneuver Area

Thus there were seven final supply destinations with a total daily loaded car movement of five box cars and six tank cars, or 11 cars per train. All rolling stock was rented for the maneuver period. No refrigerator cars were procured except those for railhead storage. Perishable items requiring protection made up so small a part of the daily tonnage that it was found practical for the various civilian suppliers to deliver these by truck to each railhead. In some cases, one truck could supply as many as three railheads. This reduced the daily car movement and saved at least one re-handling of perishables but probably would not have been workable with larger forces or for a longer period. Moreover, most of the perishables moved into the area by rail and the truck movement was merely a distribution from cars.

For the movement of the "daily trains," the Delaware & Hudson furnished a locomotive, caboose and crew. On reporting at Plattsburg barracks, the latter became a part of the military supply system for the duration of the run, and, excepting occupancy of main D. & H. running tracks, their movements were subject to the orders of the Regulating division alone. This practice resembled the operation of American military trains over the French railways in the late war.

Daily Movement Routine

All train movements were made at night. Locomotive and crew reported at Plattsburg barracks about 9 p. m., when the conductor received the train consist from the Regulating division. This varied little from day to day, due principally to the short maneuver period. Hence, the operation, though somewhat complicated, was largely that of a local freight run and offered little beyond what a train crew would meet in ordinary experience. The chief complication arose in serving two water points with three daily cars each, a movement involving a total of 12 cars. Here, because distances were short, it was found practicable to do the work with nine cars by pulling back the three empties from Spellmans, filling them at Plattsburg barracks while the train was working the Chateaugay branch, and hauling the re-filled cars to Laphams Mills with the Ausable branch cars.

The normal daily operation of the train was as follows:

(1) Engine and crew report at Plattsburg Barracks.

(2) Move box car for Beekmantown and three tank cars for Spellmans, picking up empties and returning to Plattsburg barracks.

(3) Leave at Plattsburg barracks the empty tanks from Spellmans for filling.

(4) Move box cars for South Plattsburg and Morrisonville, picking up empties and returning to Plattsburg barracks.

(5) Move three tanks to Laphams Mills, and box cars for Peru and Ausable Forks, picking up empties and returning to Plattsburg barracks.

(6) Set up warehouse and water tracks for day's loading.

(7) Engine and crew released.

The geography of the region favored this schedule and the night's run, about 83 miles, was generally finished within an eight-hour period. The record was 6 hours, 30 min.

A non-commissioned officer, acting as train guard, rode the train each night as representative of the Regulating division. His duties were to watch the run of the train, reporting the actual arrival time at each railhead and any other incident which showed a departure from the normal. In case of accident or other incident which might prevent or seriously delay the arrival of cars at any railhead, he was instructed to notify the Regulating

division by telephone, so that proper measures could be taken to protect the day's rations for that point. The late arrival of the train at a railhead would have completely upset the supply service for that day and a derailed or crippled car might have been a calamity, unless there were substitute measures ready at hand for duplicating the missing supplies; hence the possibility of a mishap was taken rather seriously. It is pleasant to record, however, none occurred.

The schedule required the daily train to occupy the main line between Spellmans and South junction at five different times. The main line during the maneuver period had a total daily movement of about 14 passenger and six freight trains. This density was increased during the start and completion of maneuvers by the additional movement of some 50 troop trains. That operation of the "daily train" could be imposed upon this other traffic without serious delay or accident of any kind indicates what can be accomplished when the railroad and the army work hand in hand.

The chief point that may be drawn from these operations is the importance of close contact between the army and the railroad. If military men sometimes show a lack of comprehension in railroad matters, it is equally true that many railroad men display a sort of tolerant superiority when confronted with a military situation. The two parties must grow into a closer understanding if the railroads are to take their full share of the problem of national defense. The Plattsburg experience shows that this understanding is not very hard to obtain.

It is also significant that the army decided to base its supply system upon the railroad. It is a conservative estimate that twenty 2½-ton trucks and sixteen 3,000-gal. tank units would be required to move over the highways the same tonnage which was handled each night by a small engine, a handful of cars and five men.

Turns X-Ray on Truck Propaganda

(*Continued from page 281*)

them in federal aid. The basis of this claim is that they have received from the federal government $2,250,000,000 in the 20-year period 1917-1937 and that they have paid to the federal government in excise taxes on oil and gas, motor vehicles and parts, $2,574,000,000, leaving a credit to their account of $324,000,000. The facts are, however, that from 1917 to 1927 the automobile industry contributed as a whole about $1,143,000,000 in war excise taxes. These excise taxes applied to all transportation and communication agencies. The railroads themselves paid over $955,000,000. For this they receive no credit from the truckers. The federal government, 1917-1937, through appropriations and gifts of materials to public roads, contributed over $1,450,000,000. In this period, therefore, the truckers failed to pay in excise taxes what they received in subsidies by $309,800,000. If these payments are counted against receipts, then all war-time taxes on the automobile industry are cancelled and it stands as a specially favored industry."

And the truckers forget all about W. P. A. highway expenditures of over $2,448,000,000 through the end of 1938 and millions more by the P. W. A.

A special point made these days by the trucking industry is that trucks paid $417,500,000 in taxes for 1937 while the railroads paid only $328,000,000. In the same study of the Bureau of Public Roads upon which the truck tax total is *estimated*, Dr. Duncan has found a table which shows that *trucks under three tons paid 80 per cent of all fees and taxes represented in the $417,500,000-figure.* Obviously the for-hire trucks, being almost entirely of the over-three-ton class, could not have paid more than 20 percent of this total, or $83,500,000, as a group. But not all of the latter class operate over the rural highways; according to the trucking spokesmen's own calculation more than two-thirds of them work in cities and towns. "On this basis, therefore, the fees and taxes paid by trucks three tons and over in intercity competitive traffic could not be more than one-third of $83,500,000 or $27,830,000. The railroads are taxed to the extent of more than $35,000,000 for highway improvement, or about $8,000,000 more than these truckers." And railroads run on their own rails.

How about the argument that the trucking industry employs 3.5 million men? Well, a vast portion of that number are employed in farm, delivery and drayage services which operated before the motor common carrier existed. The for-hire truckers claim about a million men employed to handle five per cent of the U. S. freight traffic. On this basis it would require 20 million men to handle all of the latter, "or upward of one-half the total gainfully employed in all business. With subsidy and low wages the trucking industry claims an annual revenue of two billion dollars on five per cent of the traffic. The railroads handled 65 per cent of the freight traffic for $3,378,000,000. Proportionately, to handle all the railroad traffic, trucks would require revenues of thirteen times the two billion dollars, or twenty-six billion dollars. Could traffic move under such a burden?"

The truckers say they perform a great service. Says Dr. Duncan: "The railroads agree that trucks have an important and useful place in the transportation field. There has always been a supplemental service to be performed. The railroads have agreed with action taken by the Farm Bureau and the Grange consistently for many years that 'farm to market' roads should be improved. It is not, however, in public interest for trucks to duplicate essential rail service on the basis of a vast subsidy, or for them to enter long distance transportation, for which they are not suited, which they cannot perform without government subsidy, and where their attempt to do it only injures essential rail service."

The truck interests have been especially successful in bandying so-called "state barriers" about and in blaming railroad support for them. And the Department of Agriculture has apparently accepted the Highway Users' viewpoint without question. For example, the writer complains, in its pamphlet on "Barriers to Internal Trade in Farm Products" there is nowhere to be found any reference to state regulations enforced on railroads such as train limit or full-crew laws "or of the multitudinous exactions made upon rail carriers by states and communities. There is nowhere mention made, for example, of the Commodity Control Board in the Department of Agriculture that, in applying its enforcement to marketing of watermelons, for instance, strictly controls the movement by railroad and lets truckers escape over the state border with grades that are prohibited to rail carriers. There is no reference to inspection rigidly applied to rail shipments that is escaped by highway carriers. There is no thorough-going discussion of the demoralizing effect upon market prices, standards and grades of commodities brought about by unrestricted operation of merchant truckers. Very little is said with respect to these free lances, of false grades, false standards, false weights, the harmful effects upon established marketing agencies and the general exploitation of their freedom by roaming the highways."

NEWS

N. O. I. for 1939 $588,800,892

2.26 per cent return compares with 1.43 per cent in previous year

Class I railroads of the United States in 1939 had a net railway operating income of $588,800,892, or a return of 2.26 per cent on their property investment, as compared with $373,150,639 or 1.43 per cent in 1938 and $868,719,483 or 3.36 per cent in 1930, according to the Bureau of Railway Economics of the Association of American Railroads.

Gross operating revenues in 1939 totaled $3,995,070,943, compared with $3,564,829,551 in 1938, and $5,280,234,535 in 1930, an increase of 12.1 per cent in 1939 above 1938, but 24.3 per cent below 1930. Operating expenses in 1939 amounted to $2,918,215,991, compared with $2,721,494,485 in 1938, and $3,931,043,991 in 1930—7.2 per cent above the former, but 25.8 per cent below 1930.

Class I roads in 1939 accrued $355,766,155 in taxes, compared with $340,694,548 in 1938, and $348,536,962 in 1930. For December alone, tax accruals amounted to $24,315,298, a decrease of $2,295,109 or 8.6 per cent below December, 1938. Fourteen Class I roads failed to earn expenses and taxes in 1939, of which five were in the Eastern district, four in the Southern district and five in the Western district.

For December alone the net railway operating income was $60,953,114 which, for that month, was at the annual rate of 3.31 per cent; in December, 1938, the net was $49,418,855 or 2.69 per cent, and in December, 1930, it was $48,505,431 or 3.06 per cent. Gross for December amounted to $345,246,952, compared with $318,281,036 in December, 1938, and $373,652,000 in December, 1930; operating expenses totaled $249,012,819, compared with $232,619,459 in the same month in 1938, and $294,575,875 in December, 1930.

Class I roads in the Eastern district in 1939 had a net railway operating income of $331,189,060, or 2.73 per cent, as compared with 1938's $195,403,062 or 1.6 per cent, 1930's $438,492,623 or 3.75 per cent. Gross in the Eastern district in 1939 totaled $1,968,245,248 an increase of 16.8 per cent compared with 1938, but a decrease of 24.9 per cent compared with 1930; operating expenses totaled $1,395,644,735, an increase of 10.6 per cent above 1938, but a decrease of 28.6 per cent below 1930. The Eastern-district net for December was $34,635,501, compared with $26,294,379 in December, 1938, and $21,936,644 in December, 1930.

In the Southern district, last year's net was $79,592,778, or 2.51 per cent; in 1938, it amounted to $60,204,026, or 1.91 per cent, and in 1930 it was $88,405,629 or 2.68 per cent. Gross in the Southern district in 1939 amounted to $512,031,351, an increase of 8.6 per cent compared with 1938, but a decrease of 20.2 per cent under 1930; operating expenses totaled $378,090,050, an increase of 5.8 per cent above 1938, but a decrease of 24.8 per cent under 1930. Class I roads in the Southern district for December alone had a net of $8,680,183, compared with $7,913,515 in December, 1938, and $8,768,588 in December, 1930.

The 1939 net in the Western district was $178,019,054, or 1.66 per cent, as compared with 1938's $117,543,551, or 1.1 per cent. In 1930 the Western-district net was $341,821,231, or 3.14 per cent. Gross in the Western district in 1939 amounted to $1,514,794,344, an increase of 7.5 per cent above 1938, but a decrease of 25 per cent under 1930; operating expenses totaled $1,144,481,206, an increase of 3.8 per cent compared with 1938, but a decrease of 22.4 per cent under 1930. December's net in the Western district was $17,637,430 compared with $15,210,961 in December, 1938, and $17,800,199 in December 1930.

CLASS I RAILROADS—UNITED STATES

Twelve Months ended December 31, 1939

	1939	1938	1930
Total operating revenues	$3,995,070,943	$3,564,829,551	$5,280,234,535
Total operating expenses	2,918,215,991	2,721,494,485	3,931,043,991
Taxes	355,766,155	340,694,548	348,536,962
Net railway operating income	588,800,892	373,150,639	868,719,483
Operating ratio—per cent	73.05	76.34	74.45
Rate of return on property investment—per cent	2.26	1.43	3.36

Month of December

	1939	1938	1930
Total operating revenues	345,246,952	318,281,036	373,652,000
Total operating expenses	249,012,819	232,619,459	294,575,875
Taxes	24,315,298	26,610,407	19,891,622
Net railway operating income	60,953,114	49,418,855	48,505,431
Operating ratio—per cent	72.13	73.09	78.84
Rate of return on property investment—per cent	3.31	2.69	3.06

R. R. Researchers Named "Pioneers"

Farmer, Grondahl, and Buckwalter receive "Modern Pioneer" scrolls from N. A. M.

Clyde C. Farmer, director of engineering for the Westinghouse Air Brake Company, Dr. Lars O. Grondahl, director of research and engineering, Union Switch & Signal Co., and Tracy V. Buckwalter, vice-president, Timken Roller Bearing Company, were named "Modern Pioneers" and received scrolls signifying their honor at a dinner meeting sponsored by the National Association of Manufacturers in Cleveland, Ohio, on February 7. Thus honored for original contributions in the fields of railroad brake equipment, electric signaling, and bearings for rolling stock, respectively, Messrs. Farmer, Grondahl and Buckwalter were among 30 inventors and industrial research men from the Ohio and Western Pennsylvania area who were named "Modern Pioneers" for the part they play in "the new frontiers" of science. The "Modern Pioneers" program, which commemorates the 150th anniversary of the American patent system, contemplates that some 500 nominees will receive "Modern Pioneer" certificates at regional dinners scheduled during February in 14 industrial communities throughout the country (of which the Cleveland dinner

Clyde C. Farmer

was the first), while 19 men out of 1,000 nominees will receive the national awards at the main dinner to be held in New York on February 27.

Mr. Farmer received the "Modern Pioneer" award for his invention and development of the "AB" air brake for freight service, for which he has been granted the basic patent covering the principal characteristics and 24 supplementary patents. Behind this award is an entire career devoted to the field of air brake engineering. When a young machinist in the shops of the Southern Pacific, Mr. Farmer grew interested in this work and decided to specialize in it. After years of experience in air brake work with various roads, he entered the employ of Westinghouse as

Blank & Stoller

L. O. Grondahl

a field inspector in 1901. In 1905 he was made resident engineer for the Western district, with headquarters in Chicago, and, in 1913, was advanced to the position of assistant district manager, continuing, however, as directing head of all engineering matters in the district. Finally in 1919, he was appointed director of engineering for the company with headquarters at Wilmerding, Pa., which position he has held since that time. Mr. Farmer has been granted some 458 patents and was awarded the George R. Henderson Medal by the Franklin Institute in 1938 "for meritorious inventions and discoveries in the field of railway engineering."

Dr. Grondahl was named a "Modern Pioneer" primarily for his discovery of the principle upon which the copper-oxide rectifier is based, important to the railroad field for signaling and power transmission. The citation in the award of Dr. Grondahl states that he has been honored "in consideration of his recognition of the potential value of an accidentally discovered phenomenon in physics and of his subsequent masterly development of the principle involved into an extremely valuable engineering appliance, the copper-oxide rectifier."

The rectifier development was carried out by Dr. Grondahl and his associates of the Union Switch & Signal Co., and their contributions to the field have been the subject of patents granted both to Dr. Grondahl and those working under his direction. He was born in 1880 at Hendrum, Minn., and graduated from St. Olaf College in 1904. He received his M.S. degree in 1905 and Ph.D. in physics from Johns Hopkins in 1908, studying later at the University of Chicago and the University of Berlin, Germany. Between 1904 and 1920 Dr. Grondahl served as instructor and professor of physics at various colleges and universities. Between 1917 and 1919 he also worked with the Naval Consulting Board on research in submarine detection. In 1920 he was appointed director of research of the Union Switch & Signal Co., which position he held until his appointment as director of research and engineering in 1937. He is chairman of the Executive Committee of the National Advisory Council on Applied Physics of the American Institute of Physics.

Mr. Buckwalter was honored, among other things, for his notable research in the application of roller bearings to railroad locomotives and cars. He was directly connected with railway service with the Pennsylvania between 1900 and 1916, becoming in the latter year chief engineer of the Timken Roller Bearing Company. Since 1922 he has been a vice-president of that company in charge of engineering and research. A more complete report of his engineering contributions will be presented in next week's *Railway Age*.

Fred W. Sargent Dies

Fred W. Sargent, who resigned on June 1, 1939, because of ill health, as president of the Chicago & North Western and all of its subsidiaries, including the Chicago, St. Paul, Minneapolis & Omaha, died on February 3 at the Evanston hospital, Evanston, Ill. Mr. Sargent, who before his resignation had been president of the North Western since 1925, had been failing in health for several years. In 1935, he underwent a kidney operation and at the time of his resignation he was recuperating from treatment for a liver ailment. In addition to his railroad career, he was prominent in educational and civic work and was active in numerous business enterprises. A biographical account of Mr. Sargent's career, accompanied by a photograph, was published on page 945 of the *Railway Age* of June 3, 1939.

Engineers' Report Shows Streamliners Still Thrive

The statistics of 100 "streamline, lightweight, high-speed passenger trains" show without doubt that they are highly popular and proven financial successes, according to an 82-page report prepared by Coverdale & Colpitts, consulting engineers, New York, for the Edward G. Budd Manufacturing Company, Philadelphia, Pa., issued this week. Covering traffic and earnings statistics of selected trains for the years ended June 30, 1938, and 1939, the report has been made for the purpose of bringing the figures of a basic report dated June, 1938, (reviewed in the *Railway Age* of November 12, 1938, page 717) down to June 30, 1939. Classification of material, and methods of analysis are similar in both reports, and the preparatory discussion of the field of streamliners is repeated exactly in this latest "edition."

For each train touched on, the report gives a short history, details of consist, seating capacity, etc., characteristics of regular routes, speed averages and, where obtainable, revenue and traffic statistics. The latter are lacking for a number of the trains, however, because the railroads do not segregate the applicable figures from total train returns.

Statements of revenues and expenses do not include the items of interest, depreciation, taxes or insurance, since these overhead charges are not directly assignable to train operation. For a similar reason, terminal rentals are also omitted from the calculations.

The report credits the rapid extension and improvement of streamliners to a number of organizations. Pullman-Standard Car Manufacturing Company and the Edward G. Budd Manufacturing Company are cited as leaders in new car construction; the Electro-Motive Corporation for its development of the Diesel two-cycle engine practicable for high-speed locomotives and the Union Pacific, Chicago & North Western, Southern Pacific, Chicago, Burlington & Quincy, Atchison, Topeka & Santa Fe and the Chicago, Rock Island & Pacific for their promotion of modern passenger-train equipment on their respective lines.

As in the 1938 report, *Railway Age* is also cited as important in such pioneering: "Perhaps no instrumentality not directly engaged in the construction or operation of railroad trains has done more to promote and encourage the introduction of the new types of passenger equipment on American railroads than has the *Railway Age*."

The Santa Fe operated the largest fleet of streamliners as of June, 1939, according to the report. Amounting to 15 separate trains, they consisted of a total of 61 cars. The two Daylights of the Southern Pacific operating between Los Angeles, Cal., and San Francisco, earned $5.28 per train-mile during the year ended June 30, 1939, which exceeds the "take" of any other train during the period covered in the report. The Daylights also enjoyed exceptionally high net earnings — $3.85 — or 72.9 per cent of gross revenues.

The highest ratio of net revenue to gross of any train in the report is found in the figures for the two Afternoon Hiawathas of the Chicago, Milwaukee, St. Paul & Pacific, which cleared 75.7 per cent of gross for the year ended June 30, 1938, and 75.3 per cent in the following year.

I. C. C. Denies Liberty Forwarding's "Grandfather-Clause" Application

Following its decision in the case involving the status of Acme Fast Freight, Inc., the Interstate Commerce Commission, Division 5, has denied the Liberty Forward-

ing & Distributing Corporation's "grandfather-clause" application for a certificate as common carrier by motor vehicle.

Railway Industry To Aid Finns

A railway industry drive to secure contributions in the New York area for the Finnish Relief Fund was organized at a luncheon at the Tennis and Racquet Club, New York, Tuesday, February 6. F. E. Williamson, president of the New York Central, is chairman of the railway group, and William B. Given, Jr., president of the American Brake Shoe & Foundry Co., is chairman of the railway supplies division. Both corporate gifts and individual contributions from employees will be solicited.

Herbert Hoover, chairman of the Finnish Relief Fund, was a guest at the luncheon and outlined the progress which has thus far been made, and emphasized the importance of widespread and generous participation of Americans in this effort. The organization of the drive has been carried forward on a volunteer basis and the comparatively small expenditures involved are being taken care of from contributions made by friends of Mr. Hoover. Every cent contributed will therefore go direct to the relief of the people of Finland.

It is understood that a similar drive will be conducted among the railways and in the railway supply industry in Chicago. Ralph Budd, president of the Chicago, Burlington & Quincy, will act as chairman for the railway group, and associated with him will be a chairman of a railway supplies division.

The vice-chairman of the New York railway supplies division is Arthur N. Dugan, vice-president, National Bearing Metals Corporation. Other members of the committee include Bard Browne, vice-president, Superheater Company; L. R. Burch, president, New York Air Brake Company; J. D. Dickinson, assistant to president, Lima Locomotive Works; C. R. Ellicott, vice-president, Westinghouse Air Brake Company; F. J. Foley, vice-president, American Locomotive Company; H. S. Henry, manager, Safety Car Heating & Lighting Company; Edward Laterman, general sales representative, Champion Rivet Company; Samuel MacClurkan, vice-president, American Arch Company; A. N. Martin, vice-president, Pyle-National Company; E. B. Smith, assistant vice-president, The American Brake Shoe & Foundry Company, and H. C. Wick, secretary, American Car & Foundry Company.

Checks should be made to the order of the Finnish Relief Fund, Inc., and contributions are deductible in computing taxable net income for federal tax returns.

Analysis of S. 2009 Being Distributed

An analysis of S. 2009 is being distributed free by the American Enterprise Association, division of Transportation Association of America, Chicago. This pamphlet, supplement No. 3 to its National Transportation Program, shows at a glance the phases approved and disapproved and includes arguments supporting the position of the Association. A congressional declaration of policy which includes an express statement in favor of private ownership and operation of transportation, voluntary unification of all types of transport under the sanction of the Interstate Commerce Commission, an adequate rate-making rule, and the elimination of the long and short haul clause or its application to all common carriers are among the nine points approved, while further government encroachment upon the field of private investment and legislation compelling the pooling of services are among the four disapproved.

A. A. R. Issues Picture of Its Own "Anatomy"

The composition, regular duties and latest activities of each of the departments and offices of the nation-wide Association of American Railroads are set forth in detail in a 72-page booklet shortly to be issued by the Association. Each department and its respective sections, divisions and permanent committees are analyzed briefly in a prefatory paragraph followed by a more detailed discussion of their recent undertakings and accomplishments.

The introduction points out that the A. A. R. members represent 96 per cent of railroad mileage in the United States, Canada and Mexico and handle 99 per cent of the traffic handled by railroads therein; that a total of 267 committees in the various departments of the Association "are at work on a great variety of problems in the production of continually better transportation" and that the publications of the railroads' big clearing-house of information number more than 700 titles, "ranging from pamphlets of general interest to extensive technical works of encyclopedic proportions."

More Than 170 Die in Nippon Train Wreck

A two-car suburban train of the Imperial Government Railways of Japan crashed into a train of gasoline tank cars at Osaka on January 29, causing the death of from 170 to 200 passengers who were trapped inside the wooden passenger coaches and burned to death. Most of them were industrial workers.

Will Deliver Passengers in Chicago Loop

The Chicago, Rock Island & Pacific has instituted a new passenger service, designed especially for woman patrons, whereby Parmelee Company transfer coupons honored between railroad stations may be used as payment for transportation to any point in Chicago's general business district. Hand baggage, under the new arrangement, may be checked upon arrival and is available to the passenger at the station from which he departs.

Coincident with this new service, a women's department has been established under the direction of Madelyn Christenson, a registered nurse. Mrs. Christenson will assist women passengers, upon advance request, in planning itineraries of points of interest in Chicago.

Fletcher to Address New York Railroad Club February 15

Judge R. V. Fletcher, vice-president and general counsel, Association of American Railroads, will address the New York Railroad Club on the subject "High Lights of Pending Railroad Legislation," at a meeting to be held at 33 West 39th street, New York, on Thursday, February 15. The stage entertainment and usual collation will follow the address.

Bill Would Set Up Road Fund in Federal Treasury

Senator Johnson, Democrat of Colorado, has introduced a proposed amendment to the bill (S. 3105) to assist the states in the improvement of highways. The Johnson amendment would create in the Treasury of the United States a road construction trust fund to which would be appropriated each year amounts equivalent to 100 per cent of the taxes collected under specified sections of the Internal Revenue Code.

Order on Northwest Petroleum Rates Again Postponed

The Interstate Commerce Commission has further postponed from February 7 to April 8 the effective date of its order in the I. & S. No. 4614 proceeding wherein it dealt with the principal interstate rail and truck rates on petroleum and its products in the Mountain-Pacific Northwest. The commission's decision in this case, which the railroads have taken to court, was reviewed in the *Railway Age* of October 7, 1939, page 533.

House Gets Refrigerator-Car Bill

Representative Ferguson, Democrat of Oklahoma, has introduced H.R. 8242 to amend Part I of the Interstate Commerce Act to give shippers of fresh meats, packing-house products or dairy products the right to furnish their own refrigerator cars. The bill is similar to S. 2753 previously introduced in the Senate by Senator Shipstead, Farmer-Laborite of Minnesota, and now pending before the Senate committee on interstate commerce which has received a favorable report from a subcommittee headed by Mr. Shipstead.

Grand Trunk to Participate in Edison Tribute

A train, typical of the period when Thomas A. Edison was a boy, will be operated by the Grand Trunk from Detroit, Mich., to Port Huron on February 10, as part of Port Huron's tribute to Edison, to be held on February 10 and 11 in connection with the premier showing of the motion picture "Young Tom Edison." In the train will be a wood-burning locomotive and a replica of the Grand Trunk baggage car on which Edison conducted his early experiments while working as a newsboy on that railroad. Mickey Rooney, star of the film, Henry Ford, Governor Dickson of Michigan, J. A. Clancey, general manager of the Grand Trunk and

others will ride the train. In contrast to this old equipment, a fast, modern train will act as a pilot to the "special" and will carry its passengers back to Detroit while it is on exhibition.

I. C. Discharges Employees Responsible for Collision

Five employees were discharged and one retired following an investigation of the rear-end collision of the "Panama Limited" with the "Louisiane" of the Illinois Central at Arcola, Ill., on January 1. The six employees found guilty of negligence include a dispatcher, two enginemen, two conductors and a flagman. As reported in the *Railway Age* of January 6, the Panama was following the Louisiane without "train control," and ran into it when it made a flag stop at Arcola.

Would Bring Oklahoma Railway Under Pension Act

Examiner M. J. Walsh has recommended in a proposed report an Interstate Commerce Commission finding that the Oklahoma Railway Company does not fall within the exemption proviso in section 1(a) of the Railroad Retirement Act, the Railroad Unemployment Act and the Carriers Taxing Act. The proceeding (Electric Railway Docket No. 9) was instituted at the request of the Railroad Retirement Board and the Commissioner of Internal Revenue.

I. C. C. Probe of Illinois Coal Rates

The Interstate Commerce Commission has instituted an investigation to determine whether intrastate rates required by the Illinois Commerce Commission on coal from producing points to Rockford, Freeport, Dixon and other destinations in Illinois west of Chicago cause discrimination against interstate commerce. The commission's action followed upon a petition filed on behalf of the Alton and other railroads operating in Illinois; the case is docketed as No. 28410 and hearings have been set for March 4 at the Morrison Hotel, Chicago, before Examiner Trezise.

Senate Votes Money for Resources Board

The Senate, on February 6, by a vote of 38 to 35, with 23 Senators not voting, inserted in the Independent Offices Bill for the fiscal year ending June 30, 1941, an item of $710,000 for the National Resources Planning Board, the entire appropriation for which was eliminated by the House last week on the ground that there was no statutory authorization for the Board.

Included in this board's projects which have been approved by the President is the transportation study noted in the *Railway Age* of January 27, page 230.

Stock Yards Under Retirement Act

The Railroad Retirement Board recently ruled the Union Stock Yard & Transit Company of Chicago an employer under the Railroad Retirement and Railroad Unemployment Insurance Acts. The ruling makes creditable under the acts service to the company from its incorporation date, February 13, 1865.

The Board ruled the company an "employer" as a "carrier by railroad subject to Part I of the Interstate Commerce Act" within the coverage definitions of the Retirement and Unemployment Insurance Acts. The United States Supreme Court on December 4, 1939, ruled the company a common carrier by railroad subject to Part I of the Interstate Commerce Act on the basis of its loading and unloading terminal facilities and its services performed. Prior to the Supreme Court decision affirming the finding of a three-judge federal court, the company filed under protest reports to the Board of compensation paid its employees. In the light of the Supreme Court decision, the company indicated on December 19, 1939, it would comply with the Railroad Retirement Acts without further protest.

N. Y. Port Authority Wants Only "A Few $100,000" For Ice-Breakers

Declaring that a critical need exists for ice-breaking equipment for the secondary channels at New York, the Port of New York Authority has sent a plea to Senator Carter Glass, chairman of the Senate Appropriations Committee, requesting that an appropriation be made to remedy this situation and prevent its recurrence—a sum which would "be no more than a few hundred thousand dollars." The chief worry of the Authority is that water-front fuel stations serving oil furnaces in private homes and supply houses of building materials dependent upon open channels are threatened by the lack of ice-breakers capable of navigating in the 85 miles of shallow channels in the port area.

German Roads Announce Polish Program

The German State Railway announces that a comprehensive program of reconstruction will make it possible to restore service over the entire network of the former Polish State Railway some time during 1940. Many important lines have already been placed in operation in German-occupied territory. It was expected that the Jablu ka Pass tunnel through the West Beskid mountains, which was destroyed by Polish troops during the campaign last summer, will be reopened before January 10, making possible through passenger train service between Berlin and Budapest, Hungary. Another international through service is planned for the near future between Berlin and Bucharest, Rumania, via Breslau and Lemberg.

Changes in Accounting Rules

The Interstate Commerce Commission has issued an order modifying the accounting classification so as to require revenue account 101, Freight, to show separately payments and allowances to railway express companies, to motor truck companies and others, to shippers and consignees who perform their own storedoor service, and payments for switching services when performed in connection with line-haul transportation on the basis of switching tariffs and allowances out of freight rates.

Another order liberalizes the accounting rules covering expenditures for additions and betterments which may be charged to operating expenses. Heretofore expenditures of $100 or more for additions and betterments had to be charged to the property account; the present order, effective January 31, permits charges to operating expenses of such expenditures up to $500, but allows any road not desiring the $500 minimum to adopt a lower limit provided it files its proposal with the commission. The order stipulates that the minimum adopted for accounting purposes shall also be used in reporting property changes to the Bureau of Valuation.

Freight Car Loading

Loading of revenue freight for the week ended February 3 totaled 657,004 cars, the Association of American Railroads announced on February 8. This was an increase of 7,516 cars, or 1.1 per cent, over the preceding week, 83,877 cars, or 14.6 per cent, over the corresponding week last year and 92,264 cars, or 16.3 per cent, over the comparable 1938 week.

As reported in last week's issue, the revenue freight car loadings for the week ended January 27, totaled 649,488 cars, and the summary for that week, as compiled by the Car Service Division, A. A. R. follows:

Revenue Freight Car Loadings

For Week Ended Saturday, January 27

Districts	1940	1939	1938
Eastern	150,034	134,993	120,269
Allegheny	141,062	113,599	101,999
Pocahontas	47,898	42,619	39,002
Southern	93,414	93,990	90,888
Northwestern ..	76,819	68,462	62,209
Central Western	97,196	93,084	91,730
Southwestern ..	43,065	43,712	47,079
Total Western Districts	217,080	205,258	201,018
Total All Roads	649,488	590,459	553,176
Commodities			
Grain and grain products	30,395	32,199	31,611
Live stock	11,200	12,966	12,890
Coal	171,375	136,763	129,770
Coke	13,277	8,165	6,083
Forest products.	27,832	27,917	24,759
Ore	8,840	7,640	6,973
Merchandise l.c.l.	143,370	146,436	142,180
Miscellaneous..	243,199	218,373	198,910
January 27 ...	649,488	590,459	553,176
January 20 ...	645,822	586,656	570,233
January 13 ...	667,713	582,244	580,740
January 6	592,392	529,371	552,568
December 30 ..	.....	550,270	499,455
Cumulative Total, 4 Weeks	2,555,415	2,288,730	2,256,717

In Canada.—Carloadings for the week ended January 27 totaled 50,077, an increase over last year 9,796 and of 661 over the preceding week, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
Jan. 27, 1940	50,077	24,341
Jan. 20, 1940	49,416	23,603
Jan. 13, 1940	46,575	24,425
Jan. 28, 1939	40,281	20,851
Cumulative Totals for Canada:		
Jan. 27, 1940	184,926	93,669
Jan. 28, 1939	158,307	83,479
Jan. 29, 1938	179,803	89,289

$407,000,000 Rivers and Harbors Bill Recommitted

Back to the Senate committee on commerce on February 6 went the pending rivers and harbors bill, H. R. 6264, which

passed the House at the last regular session with authorizations totaling $83,000,000 and came to the Senate calendar as a $407,000,000 measure, the commerce committee having added projects estimated to cost $324,000,000. The bill was recommitted upon motion of Chairman Bailey of the committee on commerce, which earlier in the day had voted in executive session to recall the measure.

Since Congress reconvened there have been reports that the commerce committee would not move for passage of the $407,000,000 version of the bill. When it was reached during the course of the January 18 call of the Senate calendar, Senator Vandenberg, Republican of Michigan, as noted in the *Railway Age* of January 27, page 228, assailed it as an "atrocity" which he hoped would receive no favorable consideration "in the new and contrite spirit of economy which seems to have taken possession of the Congress."

I. C. C. Freight Tariff Chief Retires

Paul E. Huettner, chief of the Freight Tariff Branch in the Interstate Commerce Commission's Bureau of Traffic, has retired after 34 years of service with the commission. Associates of Mr. Huettner presented him with a purse, the presentation being made by Commissioner Aitchison on February 7.

Acme Order Again Postponed

The Interstate Commerce Commission has further postponed from February 11 to April 11 the effective date of its order in that phase of the Acme Fast Freight status case which ordered Acme tariffs stricken from the commission's files. This order of the commission is now being contested in the courts.

Lewis Confirmed for National Mediation Board

The Senate on February 1 confirmed President Roosevelt's reappointment of David J. Lewis for a National Mediation Board term expiring February 1, 1943. Mr. Lewis succeeded Dr. William M. Leiserson when the latter was transferred to the National Labor Relations Board.

11,715 Air-Conditioned Cars

Class I railroads and the Pullman Company had 11,715 air-conditioned passenger cars in operation on January 1, according to reports received by the Association of American Railroads. This was an increase of 738 compared with the number of air-conditioned passenger cars on January 1, 1939.

Of the total number of such cars, Class I roads on January 1, this year had 6,596, an increase of 574 compared with the same date last year. The Pullman Company on January 1, this year had 5,119 air-conditioned passenger cars in operation which was an increase of 164 compared with January 1, 1939.

Annual Report of the Alaska Railroad

The Alaska Railroad, during the fiscal year ending June 30, 1939, carried 27,436 passengers, who paid a total of $259,452, according to the annual report of the Governor of Alaska to the Secretary of the Interior, Harold L. Ickes. The rail-line freight traffic amounted to 157,904 tons, of which 104,066 tons consisted of coal. The revenue from this freight totaled $1,634,393.

The report points out that the total operating revenues were $2,353,927, while the total operating expense was $2,371,490. Nonoperating income totaled $1,737, while the deficit from operations amounted to $19,831.

Two Emergency Relief allotments were made available to the railroad during the year: $168,400 to give employment to relief laborers during the months of July to October, 1938, and $64,361 for use during May and June, 1939. Also, a new hotel constructed at McKinley Park, was placed under the management of the railroad and opened for operation on June 1, 1939.

The combined total payroll, including the Chicago, Seattle, and Washington, D. C., offices, was $2,136,799.

Seek Fourth-Section Relief to Meet Private Barge Competition

Eastern and Southern railroads have applied to the Interstate Commerce Commission for relief from the fourth section's long-and-short-haul clause to permit the establishment of rate reductions running up to 15 cents per 100 lb. on iron and steel articles moving to Gulf of Mexico ports. The purpose of the relief sought is to meet water competition, chiefly that of private barges.

The reduced rates, subject to a carload minimum of 70,000 lb., as compared with 36,000 lb. generally applicable with present rates, would apply to New Orleans, La., Gulfport, Miss., Pascagoula, Ala., Mobile and Pensacola, Fla. From Birmingham, Ala., to New Orleans the cut would be from 37 cents to 22 cents, while the rate from Birmingham to Mobile would be 19 cents, or three cents under New Orleans. The proposal also contemplates reductions of 15 cents per ton because of market competition from St. Louis, Mo., East St. Louis, Ill., Ohio river crossings, Virginia-Maryland gateways and points in Official territory including Illinois to Gulf ports. The request for relief is Fourth Section Application No. 18250.

P. R. R. Affiliate Gets Certificates

The Interstate Commerce Commission, Division 5, has conditionally granted certificates to the Willett Company of Indiana, Inc., affiliate of the Pennsylvania, for common-carrier trucking operations over several routes in Illinois, Indiana, and Kentucky. Although the proposed plan of operation contemplates that the railroad alone would deal with the public, the commission finds that Willett is a common carrier by motor vehicle under the doctrine of the Substituted Freight Service decision.

The conditions attached to the grant of the certificates are the five which the commission has been imposing in similar cases to limit the highway service to that which is auxiliary to or supplemental of rail services of the parent railroad. In a brief concurring expression Commissioner Lee stated that he agreed with the finding that Willett is a common carrier solely because of the Substituted Freight Service decision to which he dissented.

Rockets Carried 516,691 Passengers in 1939

Rocket trains of the Chicago, Rock Island & Pacific carried 516,691 passengers in 1939. The Peoria Rocket carried 142,313 passengers on two daily round-trips between Chicago and Peoria, Ill.; the Des Moines, 109,391 on one daily round-trip between Chicago and Des Moines, Iowa; the two Kansas City-Twin Cities, 88,488, between Kansas City, Mo., and the Twin Cities; the two Kansas City-Dallas, 110,682, between Kansas City and Dallas, Texas; the Texas, 48,957, between Ft. Worth and Houston; and the two Rocky Mountain, placed in service on November 12, 16,860.

The total mileage covered by these trains during the year was 1,629,132 miles. The Peoria covered 235,160 miles; the Des Moines, 261,340 miles, the Kansas City-Twin Cities, 359,890 miles; the Kansas City-Dallas, 457,712 miles; the Texas, 206,590 miles; and the Rocky Mountain, 108,440 miles.

1939 Locomotive Shipments

Locomotives shipped in 1939 totaled 356 as compared with 261 in 1938 and 519 in 1937, according to reports received by the Bureau of the Census, Department of Commerce, from builders other than railroad shops. Unfilled orders at the end of last year totaled 156 locomotives, as compared with 100 on December 31, 1938, and 166 at the close of 1937.

The 1939 total included 69 steam locomotives, 251 Diesel-electrics and 21 of other types for domestic service, and eight steam, four electrics and three Diesel-electrics for export. In 1938's total of 261 there were 123 steam locomotives, six electrics and 111 Diesel-electrics for domestic service, and 20 steam and one Diesel-electric for export. December shipments totaled 41 locomotives as compared with 37 in November and 21 in December, 1938.

Data supplied by the Car Service Division, Association of American Railroads, on locomotive building in railroad shops show that 50 locomotives, including 32 steam and 18 electrics, were thus produced last year. As of January 1, this year, railroad shops reported unfilled orders for 54 locomotives, including 34 steam and 20 electrics.

General Railway Signal Company Annual Report

The General Railway Signal Company reports for the year ended December 31, 1939, a gross operating profit, before maintenance, repairs and depreciation, of $1,485,616, and a net income for the year of $247,593, as compared with a gross operating profit for 1938 of $1,032,499 and a net loss of $133,352. During the year the company paid its regular 6 per cent dividend on preferred stock. Paul Renshaw, president, in his accompanying statement to stockholders, states that orders booked in 1939 were 108 per cent of the average volume for the five years ended December 31, 1938, and 200 per cent of

bookings for 1938. Orders filled were 104 per cent of the five-year average and 112 per cent of those for 1938. Unfinished orders on hand at the end of the year were 46 per cent of the five-year average and 147 per cent of those on hand at the end of 1938. Of the total business booked, 34 per cent was for new signaling projects and 66 per cent for repairs and renewals. Mr. Renshaw also points out that the company set aside a reserve of $125,000 out of surplus during the year to cover possible losses, at present unrealized, on its foreign investments, in the light of conditions abroad.

Ask to Reopen Southern Governors' Rate Case

The New England Governors' Railroad Freight Rate Committee has asked the Interstate Commerce Commission for a reopening and reconsideration of the majority's finding in the so-called Southern Governors' Rate Case, recently decided by the commission. The New England Governors' petition asserts that "the report is not a proper reflection either of the record or of the rate-making principles which should apply in the light of the record."

"Also," it continues, "the majority decision in this proceeding cannot be reconciled with the decision of the commission in the matter of divisions of rates on interterritorial traffic between official and southern territories." "We believe, therefore," it concludes, "that the case must perforce be reopened if for no other purpose than to modify the order. What we here pray is that so long as its reopening is a necessity, the commission will reconsider its action and approach the matter *de novo* since it now has before it all the objections to a report in final, rather than in 'proposed' form."

Among other interveners asking for a reopening of the case are the northern carriers, several mid-western states, and various chambers of commerce in cities in central territory.

K. C. Produce Terminal Case Postponed to February 19

A hearing before the district court at Kansas City, Mo., on government charges of violation of the Elkins Act by the Union Pacific, the city of Kansas City, Kan., and a number of produce dealers, which was to have started on January 3 and which was postponed to January 29, has again been postponed, this time to February 19. Since January 3, however, a number of depositions have been taken before Charles H. Thompson, a United States commissioner, and the district court has ruled on a number of motions.

On January 29, the court overruled a defense motion asking that it vacate an order of January 3 which permits Kansas City, Mo., the Chicago, Burlington & Quincy, the Atchison, Topeka & Santa Fe, the Missouri Pacific and the Chicago, Rock Island & Pacific to enter the suit. The defense contended that Kansas City, Mo., and the four railroads had no legal rights as plaintiffs in action. A previous order directing I. C. C. examiners to turn over to the district attorney, records taken from the Union Pacific offices in Omaha, Neb., was modified to limit it to records concerned with the food terminal case. The railroad had objected to allowing attorneys for its competitors to see its confidential files.

Rock Island to Spend $7,486,000

A 1940 budget calling for the expenditure of $7,486,000 for improvements to roadway, structures and equipment on the Chicago, Rock Island & Pacific has been approved by the federal district court. Of the total, $4,339,000 is chargeable to capital account and $3,147,000 to operating expenses.

The budget provides for 26,500 tons of new rails and fastenings; 22,400 tons of second hand re-lay rails and 285,000 cu. yd. of ballast. A total of $1,471,000 is included for improvements to bridges over the system lines and $409,000 for signaling. The major signal work consists of the installation of automatic block signals between Des Moines, Iowa, and Iowa Falls; between Fort Worth, Tex., and Saginaw, and between Little Rock, Ark., and Biddle, and the installation of interlocking plants at South Bend, Neb., and Chickasha, Okla. A total of $243,000 is scheduled for improvements to station facilities and $381,000 for shops, power plants and shop machinery and tools.

The major expenditures for equipment consist of the modernization of ten passenger locomotives, including the application of roller bearings. The budget also provides for the application of roller bearings to 30 freight locomotives; and the enlargement of tender tanks and driving wheels. Improvements to freight cars consist of the application of the latest type automatic air brakes to 200 cars; widening decks on flat cars, and the building of double deck stock cars and cabooses.

Southern Roads Ask Reopening of Divisions Case

Southern railroads, with the exception of the Norfolk Southern, have asked the Interstate Commerce Commission to postpone indefinitely its order in the north-south divisions case, details of which were given in the *Railway Age* of August 26, 1939, page 320, which would become effective March 1, 1940, in order that there may be a rehearing and reargument of the matter. The petition also requests that the commission make substantial increases in the divisions which it prescribed for the southern roads.

Although it was expected that the net effect of the decision would be to leave pretty much undisturbed the present apportionment of revenues between the contending carrier groups, the southern roads now claim that the results of current traffic tests show that the divisions prescribed will take more than $1,300,000 a year from them and give it to the northern roads.

Meanwhile, the Florida East Coast has asked the commission to reopen its recently-decided divisions case in which a readjustment was ordered of the divisions accorded the carrier out of the Southern-territory proportion of joint through rates on fresh vegetables and citrus fruits moving from points on the F. E. C. to destinations in Eastern Trunk-Line and New England territories. At the same time the road asked that the commission also continue in effect, pending a further hearing, its order of November 6, 1939, to become effective March 1, and assign the case for further hearing at St. Augustine, Fla., at the earliest practicable date.

The petition claims that the present scale of divisions fixed in the commission's decision is too low and will not yield enough revenue to enable it to get out of bankruptcy and stay out, once it is reorganized.

Club Meetings

The Traffic Club of Philadelphia, Pa., will hold its annual meeting on February 12 in the Benjamin Franklin Hotel. Luncheon will precede the annual election at 12.

The New England Railroad Club will hold its next meeting at the Hotel Touraine, Boston, Mass., on February 13. E. D. Campbell, general mechanical engineer, American Car & Foundry Co., will discuss the subject "Riveted and Welded Construction of Freight and Passenger Cars," to be illustrated with lantern slides. A dinner will precede the meeting at 6:30.

The Railway Club of Pittsburgh, Pa., will hold its next meeting in the Fort Pitt hotel on February 22. O. W. Carrick, assistant vice-president, Electro-Chemical Engineering Corporation, Chicago, will present motion pictures showing the behavior of steam and water in a locomotive boiler in service. Dinner will precede the meeting at 6:30 p. m.

The Car Department Association of St. Louis, Mo., will hold its next meeting in the DeSoto hotel on February 20. Joe Marshall, special representative, Freight Claim division, A. A. R., will discuss "Loss and Damage and the Car Man." To care for second and third shift men, Mr. Marshall will also appear at a morning meeting at the same place at 10 a. m. and discuss "Equipment and Claims."

Equipment Depreciation Orders

Equipment depreciation rates for 18 railroads, including the Chicago, Milwaukee, St. Paul & Pacific and the Spokane, Portland & Seattle, have been prescribed by the Interstate Commerce Commission in a new series of sub-orders and modifications of previous sub-orders in No. 15100, Depreciation Charges of Steam Railroad Companies. The composite percentages for all equipment, which are not prescribed rates, range from 2.96 for the Louisville & Wadley to 10.5 for the Colorado, the 15 per cent composite figure for the Angelina & Neches reflecting merely the rate on passenger-train cars, the only equipment covered in the modification of the previous sub-order applying to that road.

The Milwaukee's composite percentage of 4.15 is derived from prescribed rates as follows: Steam locomotives, owned, 4.35 per cent, leased, 3.17 per cent; other locomotives, owned, 3.69 per cent; freight-train cars, owned, 4.12 per cent, leased, 3.54 per cent; passenger-train cars, owned, 3.76 per cent, leased, 4.37 per cent; floating equipment, owned 4.74 per cent; work equipment, owned, 6.54 per cent, leased, 6.87 per cent; miscellaneous equipment, owned, 15.53 per cent, leased, 15.93 per cent.

The composite percentage for the Spo-

kane, Portland & Seattle is 3.32 per cent, derived from prescribed rates as follows: Steam locomotives, new, 2.73 per cent, rebuilt and second-hand, 4.04 per cent; freight-train cars, new 3.17 per cent, rebuilt and second-hand, 7.14 per cent; passenger-train cars, 2.64 per cent; work equipment, new, 2.69 per cent, rebuilt and second-hand, 4.14 per cent; miscellaneous equipment, 13.29 per cent.

British Roads May Get Guaranty of Net Revenues

The British government may guarantee main-line railroads and the London Passenger Transport Board an annual sum equal to their average net revenues for the period 1935 to 1937, inclusive, during the period of war control, according to a plan which has been outlined in the House of Commons by Euan Wallace, Minister of Transport. General provisions of the scheme are that the roads be operated on a joint basis of pooled revenues and expenses, stipulated charges to be received on all government traffic. Out of these pooled revenues the main-line railroads would be paid a guaranteed sum of about £40,000,000 ($158,000,000) per annum. If the amount in the pool exceeds that sum the railroads would retain all excess up to £35,000,000 ($138,250,000) beyond which the government would claim one-half of the net until the railroads reach the so-called "standard revenue" stipulated in the Amalgamation Act of 1921. All receipts still in excess would go to the Treasury.

The year 1938 was omitted from the average period for the calculation of the guaranty because it was one of abnormally low earnings.

Retirement Certifications and Terminations in December

New employee annuities certified by the Railroad Retirement Board to the Treasury in December totaled 2,022 and amounted to $172,257 a month. This is somewhat higher than the average for the first six months of the current fiscal year, which was 1,944 claims at a monthly rate of $121,799.

During December, 565 annuities which amounted to $37,382 were terminated by death. After adjustments for terminations other than by death, recertifications, and reinstatements, there were 98,539 employee annuities amounting to $6,453,596 in force at the end of the month.

No new pensions were certified during December; 358 pensions amounting to $20,444 were terminated by death. The number of pensions in force at the end of the month, after allowance for adjustments, was 37,514 and amounted to $2,192,903 a month. Forty-five new survivor annuities which amounted to $1,460 a month were certified during December and three amounting to $135 a month were terminated by death. The total number of survivor annuities in force at the end of the month, after adjustments, was 2,064 and the monthly amount payable on them was $69,449.

There were 77 new death benefit annuities amounting to $2,603 a month certified during December, three amounting to $72 a month terminated by death, and 100 amounting to $3,445 terminated by completion of the 12-month period during which such annuities are payable. This brought the number of death benefit annuities in force at the end of November to 691 on which the monthly amount payable was $24,161.

New certifications to the Treasury during December on all claims totaled after adjustments 2,145 on which monthly payments were $131,464. During the month, 929 claims amounting to $58,034 were terminated by death. After additions, terminations by death, and net adjustments for terminations other than by death, reinstatements, and recertifications, there were 138,808 claims in force at the end of December on which the monthly amount payable was $8,740,110.

Investors to Study Scheme for Voluntary Revamps

A special committee has been appointed by the National Conference of Investors, an association of railroad securities holders, to explore the possibilities of securing revision of railroad capital structures through voluntary reorganization with participation by private capital in such financing as may be necessary. This action, taken at a meeting of the special legislative committee of the Conference in New York on February 1, was in response to a letter to the conference from Senator Harry S. Truman, of the Senate Committee on Interstate Commerce and author of a bill (S. 2956) which would enable railroads to reduce their debt structures by the purchase and ultimate retirement of those of their obligations which are now selling at a substantial discount below face value in the open market.

The Senator said in his letter that he and Senator B. K. Wheeler "are of the opinion that legislation of this character should provide a means by which private financial institutions and individual investors can participate in the financing which is necessary to the accomplishment of the objective of these bills. We do not think it is in the public interest or in fact in the interest of the railroads or the holders of their securities that the entire burden of this financing fall upon the Reconstruction Finance Corporation or the federal government." The letter went on to say that on the one hand the size of the national debt makes it imperative that no burden be placed upon federal agencies which can be avoided, while, on the other, banks, savings institutions, life insurance companies and private investors generally find it difficult to employ their funds with safety.

The Senator agreed that purchases of railroad obligations for the purposes of retirement must be sufficiently large to reduce fixed charges, which may require the co-operation and supervision of a federal agency, but expressed the opinion that the full burden of such financing should not fall upon the government. He cited recent joint financing by the federal government and private capital in housing as illustration of the machinery he would like to see set up.

As a basis of preliminary study, the Conference committee will consider the possibilities of a federal corporation created to buy or guarantee the obligations of railroads or to make loans to carriers for the purchase of their own obligations. Aid by the corporation would be conditioned upon the following safeguards:

> "(1) That obligations purchased by the said corporation shall be subject to repurchase by the issuing railroad, in whole or in part, at the prices paid by said corporation.
> (2) That obligations purchased through the proceeds of a loan or redeemed from the government shall be cancelled for all purposes except as collateral to loans from a federal agency.
> (3) That no dividends shall be declared by a railroad while it is indebted to the said federal agency.
> (4) That no income or profit derived by a railroad through the purchase of its own obligations at prices below par or savings made through voluntary debt reduction shall be taxable under any law of the United States, or of any state.
> (5) Any railroad whose obligations or interest are guaranteed by the federal corporation shall set aside some portion of its earnings, after charges, for the amortization of debt.
> (6) The railroad shall pay to the said corporation a small amount each year, proportionate to its indebtedness, as a guaranty fund to compensate the federal corporation for its guaranty and to reimburse it for any loss it may sustain in assuming liability as such guarantor."

Wheeler Committee Issues Study on Eastern Systems

Senator Wheeler, Democrat of Montana, from the committee on interstate commerce, has submitted to the Senate a 514-page report, the first of six volumes, entitled, "Railroad Combination in the Eastern Region". An introductory chapter states that the entire report is concerned primarily with the eastern railroad combination since the passage of the Transportation Act of 1920, but the first volume is a history of the eastern systems from their beginning early in the nineteenth century to 1920.

"Objectives of the Transportation Act of 1920 have never been achieved", the report asserts. It goes on to say that the passage of the Act in 1920 encouraged consolidations and mergers but that it is now generally acknowledged, whether or not the principles of the 1920 law are sound, that its objectives have not been achieved. "The purpose of this report", it continues, "is not to provide an answer to that question, but to set forth the major developments of the period during which the Transportation Act has been in effect".

The report, in its final form, is the joint work of Joseph B. Hyman, assistant counsel to the Wheeler rail finance subcommittee, and Telford Taylor, associate counsel to the subcommittee, and now special assistant to the Attorney-General.

The following are the titles to the chapters in the introductory volume:

1. Railroad Combination in the Nineteenth Century.
2. Community of Interest.
3. George Gould Moves Eastward.
4. More Community of Interest and the Collapse of Gould.
5. The Passing of Community of Interest.

The six volumes, when published, will provide a source book for students of transportation who are particularly interested in the history of railroads in the eastern territory. The volumes are to be lavishly illustrated with railroad maps especially prepared for this study by the United States Coast & Geodetic Survey in the Department of Commerce.

Due to the anticipated public demand

from libraries over the country, Senator Wheeler has introduced a Senate Concurrent Resolution asking that 3,000 copies of the study be printed, 2,000 for the interstate commerce committee and 500 each for the Senate and House document rooms. It is expected that some two weeks will elapse before the issuance of the first volume, with the remaining five volumes following along at fairly regular intervals.

Monopoly-Committee Hearings on Interstate "Barriers"

The Temporary National Economic Committee (the so-called Monopoly Committee) will begin hearings on "interstate trade barriers" March 18, according to a tentative schedule made public on February 7 by Senator O'Mahoney, Democrat of Wyoming, T. N. E. C. chairman. "The Department of Commerce under the direction of Mr. Clarence Avildsen, member of the Committee from the Department of Commerce," Senator O'Mahoney said, "has been assimilating much new material on the important question of interferences with trade among the states."

Equipment and Supplies

LOCOMOTIVES

THE NEW YORK CENTRAL has under consideration the question of buying a number of locomotives.

THE OLIVER IRON MINING COMPANY has ordered ten Diesel-electric locomotives, placing three with the Baldwin Locomotive Works and seven with the American Locomotive Company.

FREIGHT CARS

THE UTAH COPPER COMPANY is inquiring for 10 air-dump cars.

THE NEW YORK CENTRAL has under consideration the question of buying a number of freight cars.

THE NATIONAL TUBE COMPANY is inquiring for two gondola cars and six hopper cars, all of 70 tons' capacity.

SIGNALING

THE BOARD OF TRANSPORTATION, CITY OF NEW YORK, has placed orders with the General Railway Signal Company for four model 5E electric interlocking machines for its subway system. Of these, one 68-lever machine will be installed at Thirty-fourth street, one 56 lever at West Fourth street, one 16 lever at Fifth avenue and one 16 lever at its Concourse yard. Included in the orders are 42 model 5 switch machines, 205 automatic train stops, 179 type A.N. color-light signals, 53 type A.N. two-arm color-light home signals, and 18 type A.N. color-light dwarf signals.

Supply Trade

R. L. Salter, chief inspector of the **Association of Manufacturers of Chilled Car Wheels,** Chicago, has been promoted to engineer of tests in charge of specifications and inspection.

D. H. McAdams, district manager of automotive compressor sales of the Ingersoll-Rand Company, with headquarters at Chicago, has resigned to become midwestern division manager of the Joyce-Cridland Company, Dayton, Ohio, with headquarters in Chicago.

C. H. McGrath, general purchasing agent of **The American Brake Shoe & Foundry Co.,** New York, has been appointed assistant to the president and **W. T. Kelly, Jr.,** assistant to general purchasing agent has been appointed general purchasing agent, reporting directly to the president, succeeding Mr. McGrath.

H. C. Sauer, manager of the Chicago branch of the service-sales division of the **Timken Roller Bearing Company,** Canton, Ohio, has been transferred to New York to succeed **J. W. Berriman,** who has been granted a leave of absence. **L. J. Halderman,** manager of the Kansas City, Mo., branch has been transferred to Chicago and has been succeeded by **F. A. Weisenberger** of the Pittsburgh sales force.

Frank J. Dolan, assistant secretary and assistant treasurer of **The Superheater Company,** has in addition to these duties, been appointed assistant to vice-president, sales, with headquarters at New York. Mr. Dolan started his railroad career during 1907, when he became associated with the New York properties of the Baltimore & Ohio, serving until 1919, during which time he was in the stores, motive power and accounting departments. In 1919 he became associated with the Delaware & Hudson in the comptroller's office. On May 15, 1920, he joined The Superheater Company as New York office manager, being appointed assistant secretary and assistant treasurer in August, 1932.

Raymond J. Newberry, assistant general traffic manager for the **Johns-Manville Corporation,** has been appointed general traffic manager, with headquarters at New York. In this position he will have charge of all commercial traffic at the company's factories, mines and warehouses. Mr. Newberry was born 42 years ago and studied industrial traffic and economics at the New York University. He was connected with the operating department, the general freight department and the president's office of the Central of New Jersey and served in similar positions with the Canadian Pacific, prior to his entering the service of Johns-Manville in May, 1916, when he began work with this company as a rate clerk. Four years later he was appointed chief rate clerk and in November, 1928, was appointed assistant general traffic manager.

OBITUARY

William E. Robertson, vice-president and manager of sales of W. H. Miner, Inc., Chicago, who died on January 31, as reported in the *Railway Age* of February 3, was born at St. Albans, Vt., on April 12, 1880, and was graduated from Norwich

William E. Robertson

University, Northfield, Vt. He entered the employ of the Miner Company on March 18, 1910, as a draftsman and worked in the drafting and mechanical departments until March, 1911, when he was transferred to the sales department as a salesman. Later he engaged in executive sales work. In December, 1923, he was elected a director of the company, and in March, 1927, was promoted to vice-president and manager of sales.

Construction

BALTIMORE & OHIO CHICAGO TERMINAL. —The State of Illinois, Division of Highways, has awarded several contracts for the construction of a subway for Archer avenue in Chicago under three tracks of the B. & O. C. T. and for the construction of two service drive grade separation bridges. A contract, amounting to $192,245 for the construction of the subway, service drive structures and the concrete approach pavement has been awarded to the Leininger Construction Company, Chicago. The contract for furnishing and fabricating the structural steel, amounting to $9,210, has been awarded the Bethlehem Steel Company, Chicago, and a contract for a traffic control system and a lighting system for the subway and the service drive structures was awarded the Street Lighting Service Company, Chicago, for $8,241. The subway structure under the tracks will consist of three, three-track I-beam spans 7 ft., 46 ft. and 7 ft. long and the service drive approaches will consist of two reinforced concrete rigid frame bridges, each with spans of 7 ft., 46 ft. and 7 ft. in length,

with 1,073 ft. of concrete approach pavement varying from 40 ft. to 50 ft. in width.

MISSOURI-KANSAS-TEXAS. — Contracts have been awarded the Austin Bridge Company and the Austin Road Company, Dallas, Tex., by the Texas Highway Department for the construction of a bridge on the M-K-T, near Fruitdale, Tex., to provide an underpass for State Highway No. 246. The bridge, which will cross the highway at an agle of 54 deg., will consist of two 44-ft. and two 48-ft. I-beam spans with a steel ballasted deck and metal railings supported on concrete spread footing type piers and abutments. The bridge will cost approximately $90,000.

MISSOURI-KANSAS-TEXAS and ST. LOUIS-SOUTHWESTERN.—The Texas Highway Department has awarded a contract to the Austin Bridge Company and the Austin Road Company of Dallas, Tex., for the construction of two railroad grade separation structures over Turney street, in Dallas. The M-K-T bridge will consist of two double track I-beam spans, each 48 ft. 6 in. long, with a metal deck and metal railings, resting on spread footing type concrete pier and abutments, and will cost approximately $61,500. The Cotton Belt single track bridge, which will cross Turney street at an angle of 35 deg., will consist of two 83-ft. deck plate girder spans with a treated timber deck, resting on concrete piers and abutments supported on treated timber piling. This bridge will cost about $47,600. Both structures will provide for two 30-ft. highway traffic lanes and four sidewalks parallel to the highway.

NEW YORK CENTRAL-ERIE.—A low bid of $1,325,273, submitted by the C. B. Moon Company, Cleveland, Ohio, covering the general contract in connection with the elimination of the grade crossings on these roads in Dunkirk, N. Y., and a low bid of $117,389, covering the building contract submitted by William E. Bouley & Co., Auburn, N. Y., have been approved by the New York Public Service Commission. The State Department of Public Works proposes to award these contracts to the low bidders.

WABASH.—Three contracts have been awarded by the Division of Highways of the State of Illinois, for the construction of two grade separation bridges under the main tracks of the Wabash at 79th street and Kedzie avenue in Chicago. The bridges will consist of one plate girder span 54-ft. long over Kedzie avenue and two plate girder spans, each 32 ft. 8 in. long, over 79th street. The substructures will be reinforced concrete piers and abutments. The contract for the construction of the bridges, amounting to $111,665 was awarded to the Kenney Construction Company, Chicago. The contract for furnishing and fabricating the steel, amounting to $101,158, was awarded the American Bridge Company, Chicago, and a third contract of $15,450 for pumping equipment and installation of a lighting system and a traffic control system, was awarded the Kil-Bar Electric Company, Chicago.

Financial

BALTIMORE & OHIO.—*Interest Deferment.*—Directors of this road voted to defer payment of contingent interest due May 1 under its adjustment plan, deciding to allocate $9,751,000 of 1939 net income to capital fund and for additional working capital.

COLORADO & SOUTHERN.—*Abandonment.*—This company has asked the Interstate Commerce Commission for authority to abandon a part of its Aguilar branch, extending from Aguilar, Colo., to Brodhead Mine, 2.4 miles.

ERIE.—*Dismissal of Application of the Chicago & Erie.*—Division 4 of the Interstate Commerce Commission, at the request of the Chicago & Erie, has dismissed its application for a loan of $7,500,000 from the Reconstruction Finance Corporation.

ERIE.—*Claims Against N. Y. S. & W.*—Walter Kidde, trustee for the New York, Susquehanna & Western, subsidiary of the Erie, which is in separate reorganization proceedings, has petitioned Federal Judge William Clark at Newark, N. J., to end a $6,983,409 suit brought against his road for certain operating charges and rentals by the Erie, which is also in reorganization. At the same time Mr. Kidde claimed in return from the Erie the sum of $9,032,900 owing to the Susquehanna representing alleged overcharges and unjust divisions accruing during the last 15 years, during which time the Erie has operated its subsidiary. Questioned items include charges collected for haulage of Susquehanna fuel coal; lighterage charges on its traffic in New York harbor; operating agreements and divisions received on coal traffic originating at mines on the Susquehanna (Wilkes-Barre & Eastern) hauled to tidewater via the Erie.

ERIE & MICHIGAN RAILWAY & NAVIGATION.—*Operation.*—Division 4 of the Interstate Commerce Commission has approved the extension for a term of five years from February 1, 1941, of an operating agreement of April 30, 1930, between this company and the Detroit & Machinac, by which the former is authorized to operate over the main line of the latter between Alabaster Junction, Mich., and East Tawas, 4.1 miles, and over a branch line of the latter between Alabaster Junction, Mich., and Alabaster, 4.3 miles.

FEATHER RIVER. — *Acquisition.* — This company has asked the Interstate Commerce Commission for authority to acquire a line of railroad extending from Land, Calif., to Ward, 28.4 miles.

ILLINOIS CENTRAL.—*Reorganization of the Chicago, Memphis & Gulf.*—Examiner C. A. Bernhard of the Interstate Commerce Commission has recommended to Division 4 that it deny authority to the Chicago, Memphis & Gulf, a leased non-operating company of the Illinois Central, to modify its interest charges and maturity of $735,000 of first mortgage gold bonds in the furtherance of a proposed plan of adjustment dated October 12, 1939 under provisions of the recently-enacted Chandler Act.

The examiner expressed the belief that the road should be consolidated or merged with a large railroad and that section 77 of the Bankruptcy Act "affords the only adequate means for dealing with that problem under the circumstances of this case."

GREAT NORTHERN.—*Abandonment by the Spokane, Coeur D'Alene & Palouse.*—The Spokane, Coeur D'Alene & Palouse has asked the Interstate Commerce Commission for authority to abandon a line extending from Coeur D'Alene, Idaho, to Dalton, 5.6 miles of main line track and 0.7 mile of side track.

ILLINOIS CENTRAL. — *Operation.* — This company has asked the Interstate Commerce Commission for authority to operate over tracks owned by the City of St. Louis, Mo., and extending over the Municipal Bridge and its approaches between St. Louis, Mo., and East St. Louis, Ill., 2.3 miles.

LOUISIANA & ARKANSAS.—*Equipment Trust Certificates.*—This company has asked the Interstate Commerce Commission for authority to assume liability for $1,536,000 of three per cent equipment trust certificates of 1940, maturing in the amount of $52,000 on September 1, 1940 and a like amount on March 1 and September 1 of each year thereafter up to and including March 1, 1943, and $51,000 on September 1, 1943, and a like amount on March 1 and September 1 of each year thereafter up to and including March 1, 1955. The proceeds will be used in part to pay the American Car & Foundry Company for construction and delivery at East St. Louis, Ill., of 300 steel-sheathed 50-ton box cars, costing $834,714. Part of the proceeds will also be used to pay for 255 all-steel 70-ton flat cars with bulk-heads, built for the transportation of wood pulp, which have already been received from A. C. F. The company also desires to purchase with these funds 8 used, oil-burning freight locomotives and one used modernized switching locomotive from the Kansas City Southern.

NEW YORK CENTRAL.—*Abandonment.*—This company has been authorized by Division 4 of the Interstate Commerce Commission to abandon its so-called Stony Clove and Kaaterskill branch, extending from Phoenicia, N. Y., to Kaaterskill, 19.2 miles, and its Hunter branch, extending from Kaaterskill Junction, N. Y., to Hunter, 2.7 miles.

NEW YORK CENTRAL-CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Operation of the Peoria & Eastern and Guarantee of Interest.*—These companies have asked the Interstate Commerce Commission for its approval of a contract to continue operations of the property of the Peoria & Eastern for a period extending from April 1, 1940, to April 1, 1960. At the same time these companies asked authority to assume liability for the interest upon $4,722,300 of extended first consolidated mortgage bonds of the Peoria

& Eastern, as a part of a plan of financial readjustment under the recently-enacted Chandler Act. Details of the P. & E.'s plan were given in last week's issue.

READING.—*Abandonment.*—This company has been authorized by Division 4 of the Interstate Commerce Commission to abandon that part of its so-called Mount Carbon branch extending from a point 2.4 miles north of Pottsville Station, Pa., northerly to the end of the branch, 1.3 miles.

ST. LOUIS SOUTHWESTERN.—*New Chairman of the board.*—A. D. McDonald, chairman of the executive committee, has been elected also chairman of the board, succeeding Hale Holden, who has retired.

ST. LOUIS SOUTHWESTERN.—*Extension of Operating Agreement.*—This company has asked the Interstate Commerce Commission for its approval of an agreement extending for five years from May 1, 1940, a contract for use by it of the railroad and other properties of the Dallas Terminal Railway & Union Depot in Dallas, Tex.

SOUTHERN.—*Abandonment by the North & South Carolina.*—The North & South Carolina and the Southern, respectively, have been granted authority by Division 4 of the Interstate Commerce Commission to abandon a line and the operation of the line extending from Virgilina, Va., to Holloway Mines, N. C., 3.8 miles.

SOUTHERN.—*Abandonment by the Atlantic & Danville.*—The Atlantic & Danville and the Southern, respectively, have been authorized by Division 4 of the Interstate Commerce Commission to abandon a line and the operation of the line extending from Hitchcock Junction, Va., to Hitchcock Mill, 8.3 miles.

TENNESSEE CENTRAL. — *Pledging of Bonds.*—This company has asked the Interstate Commerce Commission for authority to extend to December 31, 1941, the time limit for pledging and repledging as collateral security for short-term notes, $5,500,000 of its first mortgage four per cent 30-year coupon bonds, series A, due April 1, 1967.

TEXAS & PACIFIC.—*Abandonment.*—This company would be authorized (1) to abandon the portion of its so-called Ferriday branch extending from Torras, La., to Ferriday, 48 miles, and (2) to abandon operation under trackage rights of 1.7 miles of line and the use of certain yard tracks and other facilities of the Missouri Pacific at Ferriday, if the Interstate Commerce Commission adopts a recommended order of its Examiner **Lucian Jordan.**

Average Prices of Stocks and Bonds

	Feb. 6	Last week	Last year
Average price of 20 representative railway stocks..	31.72	31.49	30.26
Average price of 20 representative railway bonds..	59.14	58.96	61.67

Dividends Declared

Augusta & Savannah.—40¢, payable January 16 to holders of record January 3.

Green Bay & Western.—Capital Stock, 5 per cent; Class A Debentures, 5 per cent; Class B Debentures, ½ of 1 per cent, all payable February 19 to holders of record February 9.

Railway Officers

EXECUTIVE

L. B. Howard, secretary and treasurer of the Nashville-Franklin, has been elected also president, with headquarters as before at Nashville, Tenn., succeeding **R. R. Johnson,** whose death on January 18, is announced elsewhere in these columns.

F. H. Brown, assistant freight traffic manager on the Southern, with headquarters at Atlanta, Ga., has been promoted to vice-president of the Georgia, Southern & Florida (part of the Southern), with headquarters at Macon, Ga., a newly created position.

J. Frank Smith, secretary to the president of the Wichita Falls & Southern, has been promoted to assistant to the president, with headquarters as before at Wichita Falls, Tex., succeeding **Joe A. Kell,** whose death on November 21, was announced in the *Railway Age* of December 9.

L. A. Watkins, executive vice-president of the Missouri & Arkansas, has been elected president, with headquarters as before at Harrison, Ark., succeeding **Joe A. Kell,** whose death on November 21 was announced in the *Railway Age* of December 9. The position of executive vice-president has been abolished.

W. C. Sloan, whose promotion to assistant vice-president and general manager of the Lines West of Livingston, Mont., of the Northern Pacific, with headquarters at Seattle, Wash., was announced in the *Railway Age* of February 3, was born at Brooklyn, N. Y., on July 9, 1886, and attended Cornell University. He entered railway service in February, 1907, as an inspector on the New York tunnels of the Pennsylvania and the following year he became connected with the Brooklyn Rapid Transit Company. On April 1, 1909, he entered the service of the engineering department of the Northern Pacific as an inspector and later was promoted successively to bridge supervisor and roadmaster. In 1915, he was advanced to trainmaster at Forsyth, Mont., and two years later he was further promoted to division superintendent at Pasco, Wash. Shortly thereafter, Mr. Sloan entered the service of the United States Army and served overseas as a captain. He returned to the Northern Pacific in 1919 as superintendent of the Rocky Mountain division, and was later transferred successively to the Pasco, Yellowstone and Lake Superior divisions. In July, 1927, he was appointed assistant to the operating vice-president and on July 15, 1929, he was advanced to general manager of the lines east of Paradise, Mont. Mr. Sloan was appointed general manager of the system, with headquarters at St. Paul, Minn., and Seattle, Wash., in August, 1931, the position he held until his recent appointment.

W. C. Sloan

J. A. Maclean, office assistant to president, New York Central system, has been appointed secretary of the Eastern Railroad President's Conference, New York. He succeeds **C. L. Jellinghaus,** recently appointed manager of freight transportation, New York Central, at New York. A photograph of Mr. Jellinghaus and a biographical sketch of his railway career appeared in the *Railway Age* of August 19, 1939, page 299.

OPERATING

W. Heide, acting division superintendent on the Chicago, Rock Island & Pacific, with headquarters at Chicago, has been promoted to superintendent, with the same headquarters.

A. L. Christiansen, superintendent of car service of the Elgin, Joliet & Eastern, has been appointed superintendent of transportation, a newly created position, with headquarters as before at Joliet, Ill. **M. A. Maher** has been appointed general agent, operating department, also a newly created position, with headquarters at Joliet.

John Kennedy, superintendent and master mechanic of the McCloud River, with headquarters at McCloud, Cal., retired effective January 1. **P. N. Myers,** auditor and treasurer, has been appointed also superintendent, with headquarters as before at McCloud. **P. W. Herron** has been appointed assistant superintendent.

J. McEwen, trainmaster on the Illinois Central at Carbondale, Ill., has been promoted to superintendent, with the same headquarters, succeeding **J. B. Hamilton,** who has resigned. **C. Wall,** night yardmaster at Decatur, Ill., has been promoted to trainmaster at Carbondale, replacing Mr. McEwen.

Thomas F. Lowry, whose retirement on February 1 as assistant general manager of the Lines West of the Northern Pacific, with headquarters at Seattle, Wash., was announced in the *Railway Age* of February 3, was born at London, Ont., on January 15, 1870, and entered railway service at the age of 15 years as a messenger on the Canada Southern (now part of the Michigan Central). From 1887 to 1893, Mr. Lowry served as a telegraph operator and train dispatcher on the Buffalo, Rochester &

Pittsburgh (now controlled and operated by the Baltimore & Ohio), then becoming a telegraph operator on the Great Northern. On the latter road he was advanced successively to train dispatcher, trainmaster and division superintendent at Crookston, Minn., then being transferred to Havre, Mont. In 1911, he went with the Northern Pacific as trainmaster at Spokane, Wash., and in 1913, he was promoted to division superintendent at Dilworth, Minn. He was later transferred successively to Staples, Minn., Missoula, Mont., and Minneapolis, Minn., and on December 1, 1926, he was promoted to general superintendent of the Central district with headquarters at Livingston, Mont. Mr. Lowry was further advanced to assistant general manager, with headquarters at Seattle, on September 1, 1930, holding that position until his retirement.

C. B. Fleming has been appointed trainmaster of the New York Terminal district of the New York Central, with headquarters at New York. **J. E. Guilfoyle** has been appointed trainmaster of the Rochester division, with headquarters at Rochester, N. Y. **H. D. Johnston** has been appointed trainmaster of the Buffalo division, with headquarters at Buffalo, N. Y. **H. B. Tucker** has been appointed trainmaster of the River division, with headquarters at Weehawken, N. J.

The jurisdiction of **F. W. Kelsey,** superintendent, and **J. W. Tucker,** assistant superintendent of the Chattanooga division of the Nashville, Chattanooga & St. Louis, has been extended to include the Huntsville division, with headquarters as before at Chattanooga, Tenn. **Gordon Davis Hicks,** superintendent of the Huntsville division, with headquarters at Tullahoma, Tenn., retired on January 1.

Mr. Hicks was born at Nashville, Tenn., on September 19, 1865, and attended Montgomery Bell Academy at Nashville and Vanderbilt University, graduating in civil engineering in 1887. He entered railway service immediately after graduation as a rodman on the construction of the N. C. & St. L., and in 1888, he was appointed assistant engineer in charge of masonry on the Duck River Narrow Gauge Railroad between Fayetteville, Tenn., and Columbia (now part of the N. C. & St. L.). In 1890, Mr. Hicks was appointed assistant superintendent of the Huntsville and Columbia branches of the N. C. & St. L., and the following year he was promoted to superintendent of the Sparta branch. In May, 1891, he was appointed division superintendent of the Huntsville division and in 1913 he was transferred to the Nashville division. Mr. Hicks was transferred back to the Huntsville division, with headquarters at Tullahoma, in 1915, where he remained until his retirement.

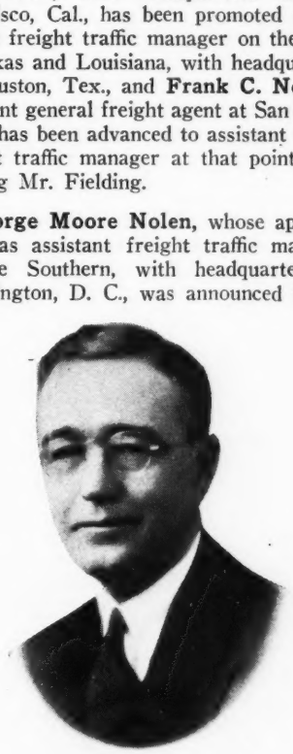
Thomas K. Williams, whose promotion to superintendent of the Mississippi division of the Illinois Central, with headquarters at Water Valley, Miss., was announced in the *Railway Age* of January 27, was born at Sabula, Mo., on July 6, 1886. He entered railway service on March 17, 1902, as an agent-operator on the old Tennessee division of the Illinois Central, and on February 9, 1905, he was promoted to train dispatcher, serving in that capacity and later as relief chief dispatcher and assistant chief dispatcher at Fulton, Ky. On December 16, 1912, he was promoted to assistant chief dispatcher at Fulton, and from August 17, 1923 until January 1, 1924, he served as acting trainmaster on the Louisiana division at McComb, Miss., returning to Fulton on the latter date. In July, 1924, he was assigned special work checking records in train dispatchers offices on the Southern lines. Mr. Williams was promoted to trainmaster at McComb on November 1, 1924, and on April 1, 1926, he was transferred to Jackson, Miss. On January 15, 1928, he was appointed chairman of a committee on the revision of the transportation rules, and upon completion of this work became chairman of the board of examiners, touring the Western and part of the Northern lines, re-examining employees. On August 1, 1928, he returned to his position as trainmaster at Jackson, and in December, 1939, he was promoted to assistant superintendent at Water Valley, where he was located at the time of his recent promotion.

TRAFFIC

T. T. Turner, superintendent of dining service of the Missouri-Kansas-Texas, with headquarters at Kansas City, Mo., has been transferred to San Antonio, Tex., a change of headquarters.

J. L. Fielding, assistant to the freight traffic manager in charge of rates and divisions on the Pacific lines of the Southern Pacific, with headquarters at San Francisco, Cal., has been promoted to assistant freight traffic manager on the lines in Texas and Louisiana, with headquarters at Houston, Tex., and **Frank C. Nelson,** assistant general freight agent at San Francisco, has been advanced to assistant to the freight traffic manager at that point, succeeding Mr. Fielding.

George Moore Nolen, whose appointment as assistant freight traffic manager of the Southern, with headquarters at Washington, D. C., was announced in the



George M. Nolen

Railway Age of February 3, was born on December 28, 1883, at Gaston County, N. C. He entered railroad service on November 10, 1910, with the Southern, filling various clerical positions at Gastonia, N. C. and Charlotte; Richmond, Va.; Washington, D. C.; Atlanta, Ga., and Birmingham, Ala. On November 1, 1922, Mr. Nolen was appointed division freight agent, with headquarters at Columbia, S. C., and on August 1, 1925, he was promoted to assistant to freight traffic manager, at Atlanta. He was appointed commerce agent at Washington on August 16, 1927, which position he held until his recent appointment as assistant freight traffic manager.

William H. Millard, whose promotion to freight traffic manager in charge of solicitation east of the Pacific coast territory, for the Northern Pacific, with headquarters at St. Paul, Minn., was announced in the

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William H. Millard

Railway Age of January 27, was born at Lincoln, England, on February 2, 1876, and entered railway service on the Pennsylvania in 1897. On April 1, 1907, he was promoted to freight and passenger agent at Houghton, Mich., and on May 1, 1909, he went with the Northern Pacific as a traveling freight agent at Chicago. Mr. Millard was advanced to general agent at Cleveland, Ohio, on January 23, 1922, and on October 1, 1923, he was transferred to Pittsburgh, Pa. He was further promoted to eastern freight traffic manager, with headquarters at New York, on April 1, 1934, the position he held until his recent promotion, which was effective February 1.

W. J. Wilkins, assistant freight traffic manager on the Southern, with headquarters at Memphis, Tenn., has been promoted to eastern traffic manager, with headquarters at New York, succeeding **W. Mason King,** whose promotion, effective February 1, to freight traffic manager, with headquarters at Cincinnati, Ohio, was announced in the *Railway Age* of January 20. **F. A. Bailey,** assistant general freight and passenger agent, with headquarters at Macon, Ga., has been advanced to assistant freight traffic manager at Memphis, replacing Mr. Wilkins, and **V. E. Cook,** division freight agent at Augusta, Ga., has been appointed assistant general freight and passenger agent at Macon, relieving Mr. Bailey.

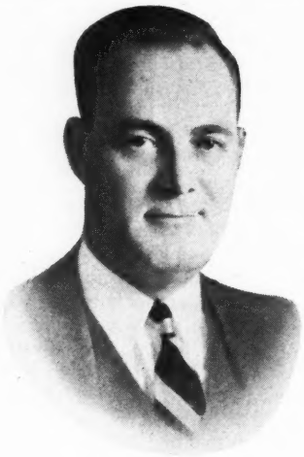
R. C. Stubbs, division freight agent on the Chicago & North Western at Chicago, has been promoted to assistant general freight agent, a newly created position, with the same headquarters, and the position of

division freight agent has been abolished. **Joe R. Clyde,** general perishable agent at San Francisco, Cal., has been transferred to Chicago, succeeding **John L. Wilser,** whose death on January 2 was announced in the *Railway Age* of January 20. **H. G. Van Winkle,** general agent, passenger department, at Chicago, and **Norman A. Hersether,** passenger and ticket agent at Chicago, have been advanced to assistant general passenger agents at that point, two newly created positions, and the positions of general agent, passenger department, and passenger and ticket agent at Chicago have been abolished.

George C. Potter, general agent, freight department, Southern, with headquarters at Philadelphia, Pa., has been appointed assistant freight traffic manager, with headquarters at Charlotte, N. C., succeeding **Carl B. Walker. L. Phillips Hungerford** has been appointed general agent, freight department, at Philadelphia, succeeding Mr. Potter. **Charles W. Gowl,** division freight and passenger agent, has been appointed general eastern freight agent, with headquarters as before at New York, succeeding **Walter H. Beard,** who has been appointed general agent, freight and passenger departments, with headquarters at Cleveland, Ohio, to succeed **F. C. Toal,** promoted. **John W. Hill** has been appointed district freight agent, with headquarters at High Point, N. C., succeeding **C. H. Dunn,** promoted. **Roland A. Davis** has been appointed division freight and passenger agent, with headquarters at New York, succeeding Mr. Gowl.

Ralph H. Morris, whose retirement on February 1 as assistant freight traffic manager on the Southern, with headquarters at Louisville, Ky., was announced in the *Railway Age* of January 27, was born at Xenia, Ill., on February 25, 1866, and entered railway service in February, 1884, as a telegraph operator on the Louisville, Evansville & St. Louis (now part of the Southern). In 1887, he was appointed secretary to the general manager and in 1889, he was appointed agent at Evansville, Ind. Mr. Morris was promoted to commercial agent at St. Louis, Mo., the following year and to general agent at Evansville in 1898. In 1904, he was appointed commercial agent at Cincinnati, Ohio, and in 1909, he was promoted to general western agent at Chicago. From 1917 to 1919, he served as assistant general freight agent at Louisville, Ky., returning on the latter date to Chicago as general western agent. Mr. Morris was promoted in 1921 to freight traffic manager, with headquarters at Cincinnati, and in 1924, he was appointed assistant freight traffic manager, with headquarters at Washington, D. C. In 1930, he was transferred to Louisville, where he remained until his retirement.

William Clark Stotler, whose promotion to general passenger agent on the Baltimore & Ohio, with headquarters at Pittsburgh, Pa., was announced in the *Railway Age* of January 27, was born at Laddonia, Mo., on January 20, 1898, and attended Washington University, St. Louis, Mo., for a short time. He entered railway service in October, 1915, on the St. Louis-San Francisco, and in 1916, he was appointed chief dispatcher's clerk at Sapulpa, Okla. He later served successively as ticket seller at Tulsa, Okla., St. Louis, Mo., and assistant ticket agent at Tulsa. On March 15,



William Clark Stotler

1924, Mr. Stotler went with the Baltimore & Ohio as traveling passenger agent at Tulsa, and in December, 1926, he was promoted to district passenger agent at Dallas, Tex. He was further advanced to division passenger agent, with headquarters at Washington, D. C., on September, 1930, and in February, 1934, he was transferred to Philadelphia, Pa. In October, 1936, he was promoted to assistant general passenger agent at Chicago, the position he held until his recent promotion, which was effective February 1.

James G. Morrison, whose promotion to general freight traffic manager, in charge of rates and divisions, of the Northern Pacific, with headquarters at St. Paul, Minn., was announced in the *Railway Age* of January 27, was born at Amboy, Ill., on December 3, 1878, and entered railway service in 1893 as a messenger on the Minneapolis & St. Louis. In May, 1894, he became a clerk on the St. Paul & Duluth (now part of the Northern Pacific) and in

James G. Morrison

April, 1897, he went with the Chicago Great Western. With the latter company, Mr. Morrison served as a clerk, chief rate clerk and chief clerk in the general freight department until October, 1909, when he was advanced to assistant general freight agent, later being promoted to assistant to the vice-president. During Federal control of the railroads, Mr. Morrison also served as assistant secretary of the Western Freight Traffic Committee of the United States Railroad Administration. In March, 1920, he entered the service of the Northern Pacific as assistant general freight agent. In December, 1925, he was advanced to general freight agent, which position he held until October 16, 1937, when he was promoted to freight traffic manager. Mr. Morrison's appointment as general freight traffic manager was effective February 1.

J. S. Mason, acting general agent for the Wabash at New Orleans, La., has been appointed general agent at that point.

Ambrose J. Seitz, assistant traffic manager on the Union Pacific, with headquarters at Salt Lake City, Utah, has been promoted to assistant freight traffic manager, a newly created position, with headquarters at Omaha, Neb. **H. L. Lauby,** general agent, freight department, at New York, has been advanced to assistant traffic manager at Salt Lake City, relieving Mr. Seitz, and **F. B. Swope,** general agent at Cincinnati, Ohio, has been transferred to New York, replacing Mr. Lauby. **D. H. Voltz,** traveling freight agent at Chicago,

Ambrose J. Seitz

has been promoted to general agent at Cincinnati succeeding Mr. Swope.

Mr. Seitz was born at Effingham, Ill. on October 28, 1897, and entered railway service on March 18, 1914, with the Missouri Pacific, leaving this company a few years later to serve with the United States government during the World War. During this period he served as confidential clerk to the chief of the Inland Traffic Service of the War department at Washington and chief clerk to the traffic assistant, Southwestern region, United States Railroad Administration, at St. Louis, Mo. From October 1, 1919 to August 1, 1920, Mr. Seitz held the position of clerk to the vice-president in charge of traffic of the Union Pacific System at Omaha, then becoming secretary to Colonel D. C. Jackling, industrialist of San Francisco, Cal. On March 1, 1922, he returned to the Union Pacific as freight traffic agent at San Francisco, being appointed general agent in the freight department at Salt Lake City on September

1, 1925. On July 1, 1929, he was further advanced to assistant to the freight traffic manager, with headquarters at Omaha, being appointed general agent in the freight department at New York City on January 1 of the following year. On May 1, 1935, Mr. Seitz was apointed general freight agent at Kansas City, his title being changed to general freight and passenger agent four months later. On January 1, 1936, he was promoted to assistant traffic manager, with headquarters at Salt Lake City, the position he held until his recent promotion, which was effective February 1.

ENGINEERING AND SIGNALING

W. E. Mellor has been appointed division engineer, Capreol division, of the Canadian National, with headquarters at Capreol, Ont., succeeding **H. E. Smith,** who has been transferred in the same capacity to the Belleville division, with headquarters at Belleville, Ont. Mr. Smith succeeds **E. R. Logie,** who has been appointed district engineer, as reported in the February 3 issue of *Railway Age*. **H. W. Froats** has been appointed bridge and building master of the Belleville division, with headquarters at Belleville, succeeding **W. J. Tyers,** who has retired.

MECHANICAL

Charles L. Christy, day roundhouse foreman on the Missouri Pacific at Falls City, Neb., has been promoted to assistant master mechanic at Wichita, Kan., succeeding **T. C. Carter,** who has been appointed day roundhouse foreman at Falls City.

C. S. Hogan has been appointed master mechanic of the McCloud River, with headquarters at McCloud, Cal., succeeding to a portion of the duties of **John Kennedy,** superintendent and master mechanic, whose retirement on January 1 is announced elsewhere in these columns.

L. R. Wink, assistant superintendent of the car department of the Chicago & North Western, has been promoted to superintendent of the car department, with headquarters as before at Chicago, succeeding **Walter E. Dunham,** whose retirement on February 1, was announced in the *Railway Age* of February 3. Mr. Wink was born on January 30, 1883, and entered railway service on August 1, 1899, as a car repairer at the Chicago shops of the North Western. In 1905, he was appointed a special inspector at the Chicago shops and in 1908, he was promoted to foreman at the Proviso Yards. He was transferred to the Wood Street freight station at Chicago in 1909, and later that year he was promoted to traveling car inspector, with headquarters at Chicago. Mr. Wink was advanced to general car foreman at the Chicago shops in 1915, and in September, 1919, he was promoted to assistant superintendent of the car department.

OBITUARY

Charles K. Dunlap, who retired on January 1, 1927 as traffic manager, Texas Lines, Southern Pacific, at Houston, Tex., died on February 4 in University, Va., at the age of 76. During the World War Mr. Dunlap was president of several roads which now comprise the Southern Pacific Lines in Texas and Louisiana.

R. R. Johnson, president of the Nashville-Franklin, with headquarters at Franklin, Tenn., died on January 18.

George Palmer Thomas, company surgeon for the Lehigh Valley, died at Rochester, N. Y., on January 30, at the age of 64.

George H. Robison, purchasing agent of the Northwestern district of the Union Pacific, with headquarters at Portland, Ore., died suddenly of a heart attack at that point on February 1.

J. F. Howe, who retired on August 1, 1931, as auditor of passenger receipts of the Denver & Rio Grande Western, with headquarters at Denver, Colo., died on January 29, at Lamar, Colo.

John F. Turner, former auditor of revenue of the Boston & Maine at Boston, Mass., who retired last summer after serving that road for 53 years, died February 1, at his home in Reading, Mass., at the age of 74.

Walter A. Doane, in 1905 and 1906, principal assistant engineer in charge of the construction of the South & Western (later the Carolina, Clinchfield & Ohio, now the Clinchfield), with headquarters at Johnson City, Tenn., and at one time chief draftsman on the construction of the Canadian Pacific through the Rocky mountains from Winnipeg, Man., to the Pacific coast, died on January 25 at Meadville, Pa. Mr. Doane was also associated in engineering and construction work during his youth with the New York Central; the Atchison, Topeka & Santa Fe and the Norfolk & Western and served as city engineer and acting city engineer of Meadeville at various times.

Walter J. Larrabee, commerce counsel of the Delaware, Lackawanna & Western, died of pneumonia February 1, at the Presbyterian Hospital, Newark, N. J., at the age of 61. Mr. Larrabee was born January 26, 1879, at Cincinnati, Ohio, and entered the service of the Lackawanna, August 1, 1901, as a clerk in the signal department. While holding that position, Mr. Larrabee studied law in New York University, and on January 1, 1909, he was appointed clerk and lawyer in the legal department, New York. He became an attorney January 1, 1915, and three years later was promoted to assistant to general solicitor. On March 1, 1920, Mr. Larrabee was made commerce counsel, which position he held until his death.

John C. Hyman, superintendent of the North Carolina division of the Seaboard Air Line, with headquarters at Hamlet, N. C., who died on January 18, was born on August 23, 1886, at Hamilton, N. C. Mr. Hyman entered railroad service in 1904 as flagman with the Seaboard Air Line, and served as conductor from 1906 to 1917. He served as assistant stationmaster at Hamlet from January 1, 1923 to June, 1923; general yardmaster, Richmond, Va., from June, 1923, to June 30, 1925; terminal trainmaster at Richmond, from July 1, 1925 to October 1, 1930 and trainmaster at Richmond from October 1, 1930 to May 31, 1939. Mr. Hyman was appointed superintendent of the North Carolina division on June 1, 1939, the position he held until his recent death.

Arthur Walter Blume, general storekeeper of the St. Louis-San Francisco, with headquarters at Springfield, Mo., whose death on January 19, was announced in the *Railway Age* of January 27, was born at Arkansas City, Kan., on October 7, 1871, and studied music at Heidelberg University, Heidelberg, Germany. Mr. Blume entered railway service in 1901 with the Atchison, Topeka & Santa Fe, at Topeka, Kan., as a clerk and served in that capacity and as traveling auditor and auditor until December 1, 1913, when he went with the Frisco as chief clerk to the general storekeeper. He later was promoted to assistant to the chief purchasing officer, with headquarters at St. Louis, Mo., and on August 1, 1919, he was advanced to general storekeeper of the Frisco, with headquarters at Springfield, the position he held until his death.

Maurice S. Connors, who retired on May 16, 1938, as assistant to the vice-president of the Chesapeake & Ohio, with headquarters at Columbus, Ohio, died on February 5. Mr. Connors was born on June 7, 1858, at Toronto, Ont., and began railway service in 1872 as a water boy on the Lake Shore & Michigan Southern (now a part of the New York Central). He became a telegraph operator and worked in that capacity on the Lake Shore & Michigan Southern, the Philadelphia & Erie (now a part of the Pennsylvania) and for the United Pipe Line Co. (now a part of the Standard Oil Company). In 1880, he became a paymaster for the construction department of the United Pipe Line Co., and in 1881, became a train dispatcher for the Evansville & Terre Haute (now a part of the Chicago & Eastern Illinois). In 1883, he became a train dispatcher on the Indianapolis division of the Cincinnati, Hamilton & Dayton (now a part of the Baltimore & Ohio), and in 1887, he was promoted to master of transportation of the same division. In December, 1889, Mr. Connors was promoted to superintendent of the Cincinnati and Indianapolis division and in May, 1890, he left the C. H. & D. to become general superintendent of the Peoria & Pekin Union. In December, 1890, he went with the C. & E. I. as a superintendent but in December, 1891, left that road to go with the Columbus, Hocking Valley & Toledo (now the Hocking Valley) as superintendent of the Hocking Valley and Ohio River division. In March, 1899, he was promoted to general superintendent, and in May, 1910, to general manager, with headquarters at Columbus. During the war Mr. Connors was federal manager of the Hocking Valley, and after the war was again appointed general manager. In May, 1930, when the Hocking Valley was merged with the C. & O., he was appointed assistant to the vice-president on the C. & O. at Columbus, Ohio, the position he held until his retirement.

Table of Revenues and Expenses begins on next left-hand page

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1939

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income 1939	Net railway operating income 1938
Akron, Canton & Youngstown	Dec.	171	$174,802	$56	$185,009	$25,752	$16,639	$13,768	$56,642	$121,216	65.5	$63,793	$53,672	$38,525	$36,396
	12 mos.	171	1,957,119	487	2,048,252	301,658	199,607	168,154	642,603	1,413,526	69.0	634,726	481,418	306,009	81,566
Alton	Dec.	959	957,812	248,914	1,437,505	126,967	268,363	48,365	545,462	1,061,531	73.8	375,974	320,846	191,607	191,571
	12 mos.	959	11,738,307	2,535,362	16,622,809	2,170,191	2,445,299	566,723	6,543,845	12,558,027	75.5	4,064,782	2,962,868	920,648	312,863
Atchison, Topeka & Santa Fe System	Dec.	13,444	10,289,454	1,517,238	13,489,179	1,860,025	3,056,074	469,514	4,896,857	10,570,352	78.4	2,918,827	1,825,090	1,800,923	1,725,707
	12 mos.	13,456	127,530,776	18,277,823	160,039,967	23,724,842	34,584,862	5,533,726	57,249,355	125,334,705	78.3	34,705,262	19,220,593	19,170,866	18,026,118
Atlanta & West Point	Dec.	93	103,737	26,386	156,824	20,413	25,599	8,376	64,841	130,790	83.4	26,034	13,425	—7,842	10,971
	12 mos.	93	1,266,772	286,235	1,819,046	219,423	316,586	97,116	780,958	1,538,072	84.6	280,974	159,555	—18,900	—105,820
Western of Alabama	Dec.	133	103,137	25,216	150,605	20,860	31,848	8,432	60,276	131,480	87.3	19,125	—1,889	2,147	35,147
	12 mos.	133	1,239,625	281,302	1,747,958	225,838	346,131	98,026	676,477	1,455,483	83.3	292,475	108,128	136,880	86,791
Atlanta, Birmingham & Coast	Dec.	639	230,227	11,096	260,683	48,726	52,050	23,484	118,898	258,346	99.1	2,337	—19,426	—43,030	8,869
	12 mos.	639	3,013,720	195,048	3,445,742	517,398	626,912	285,187	1,394,689	3,025,023	87.8	420,718	146,732	—125,511	—192,269
Atlantic Coast Line	Dec.	5,104	3,163,425	537,046	4,196,690	405,109	808,633	186,368	1,737,571	3,327,336	79.3	869,354	629,354	406,824	349,789
	12 mos.	5,105	35,566,926	6,505,631	47,099,287	4,955,142	9,104,247	1,877,740	18,671,862	36,671,780	77.9	10,427,507	6,037,507	3,781,872	2,390,751
Charleston & Western Carolina	Dec.	343	198,901	1,734	204,869	35,305	52,326	9,051	75,556	176,235	86.0	28,634	23,634	24,443	52,960
	12 mos.	343	2,416,280	13,091	2,481,511	329,535	415,991	101,089	832,858	1,751,273	70.6	730,238	480,238	453,711	291,986
Baltimore & Ohio	Dec.	6,382	12,285,166	1,000,471	14,253,893	1,344,259	3,960,316	408,638	5,185,020	11,468,211	80.5	2,785,682	1,843,342	1,475,120	1,739,671
	12 mos.	6,395	140,455,928	10,856,060	161,030,252	15,172,308	35,857,609	4,748,994	57,007,080	119,901,075	74.5	41,129,177	30,361,186	25,525,100	14,851,794
Staten Island Rapid Transit	Dec.	24	59,124	67,390	137,910	2,137	27,442	1,109	77,221	119,258	86.5	18,652	2,224	—2,651	—19,575
	12 mos.	24	669,070	850,025	1,647,228	105,560	266,172	13,314	949,668	1,479,313	89.8	167,915	—163,752	—239,503	—271,947
Bangor & Aroostook	Dec.	603	370,042	19,555	413,525	46,051	76,160	4,388	122,581	275,664	66.6	137,861	92,215	114,485	180,985
	12 mos.	603	4,700,913	182,926	5,119,439	1,007,189	998,621	69,018	1,424,071	3,803,474	74.3	1,315,965	833,034	945,739	974,778
Bessemer & Lake Erie	Dec.	224	843,440	745	866,669	92,541	255,060	12,648	183,624	584,071	67.4	282,598	210,686	271,556	93,510
	12 mos.	224	13,547,667	8,714	13,742,056	1,340,392	3,225,082	152,605	2,271,176	7,384,821	53.7	6,357,235	4,782,719	5,167,327	2,270,644
Boston & Maine	Dec.	1,910	2,837,875	650,681	4,080,176	411,214	629,516	61,001	1,621,397	2,849,124	69.8	1,231,052	1,043,505	818,387	340,691
	12 mos.	1,939	33,193,562	7,093,916	46,341,082	5,434,908	6,895,925	778,613	18,201,152	33,133,913	71.5	13,207,169	9,687,446	6,955,142	1,254,167
Burlington, Rock Island	Dec.	255	108,624	21,246	139,273	16,161	18,559	4,862	53,389	102,385	73.5	36,888	28,035	16,233	2,852
	12 mos.	255	1,102,789	217,812	1,417,213	201,768	239,970	57,648	610,664	1,224,642	86.4	192,571	91,375	355	—44,746
Cambria & Indiana	Dec.	37	138,652	.....	138,829	12,112	81,692	734	22,990	126,487	91.10	12,342	3,055	73,407	112,308
	12 mos.	37	1,438,199	.....	1,439,548	98,487	646,189	5,257	152,203	975,205	67.74	464,343	154,376	912,535	865,821
Canadian Pacific Lines in Maine	Dec.	234	278,190	13,960	305,920	22,493	54,493	7,745	120,787	210,974	69.0	94,946	84,794	65,645	79,131
	12 mos.	234	2,008,914	164,089	2,323,749	407,689	425,054	116,957	869,201	1,887,882	81.2	435,867	311,781	114,760	17,731
Canadian Pacific Lines in Vermont	Dec.	91	60,042	21,694	93,196	10,314	24,675	2,861	71,433	112,098	120.3	—18,902	—30,782	—51,765	—58,973
	12 mos.	91	782,150	121,811	1,028,137	172,882	281,081	43,918	743,429	1,278,738	124.4	—250,601	—344,038	—569,966	—715,273
Central of Georgia	Dec.	1,871	1,021,606	116,236	1,286,336	147,163	233,250	50,958	628,663	1,128,159	87.7	158,177	36,281	30,231	43,323
	12 mos.	1,871	12,507,660	1,178,602	15,363,757	2,016,887	3,190,745	627,225	6,681,407	13,393,444	87.2	1,970,313	618,496	554,686	253,987
Central of New Jersey	Dec.	710	2,457,977	346,877	3,009,798	227,269	614,732	45,874	1,196,298	2,165,577	72.0	844,221	442,720	214,182	—81,260
	12 mos.	711	26,831,774	4,420,788	33,547,419	2,778,921	6,389,536	558,231	13,538,012	24,363,838	72.6	9,183,581	4,148,698	1,943,304	259,144
Central Vermont	Dec.	422	498,537	37,373	579,746	2,840	87,155	11,566	226,612	352,249	60.8	227,497	208,208	172,451	—27,212
	12 mos.	426	4,898,430	419,251	5,801,709	812,108	970,604	142,968	2,505,705	4,676,713	80.6	1,124,996	829,920	420,693	—545,204
Chesapeake & Ohio	Dec.	3,117	8,907,315	293,792	9,571,356	962,949	2,000,715	206,754	2,378,237	5,862,826	61.3	3,708,530	3,108,131	3,121,166	2,244,387
	12 mos.	3,113	111,270,264	3,062,151	118,722,054	11,022,220	23,387,374	2,463,305	28,425,589	68,859,622	58.0	49,862,432	36,566,237	36,354,138	28,983,311
Chicago & Eastern Illinois	Dec.	925	1,030,902	158,262	1,386,409	125,641	236,020	54,769	540,654	992,388	71.6	394,021	329,021	190,853	200,314
	12 mos.	925	11,999,588	1,426,086	15,336,251	1,834,652	2,629,289	657,913	5,998,633	11,839,711	77.2	3,496,540	2,582,540	1,022,073	667,265
Chicago & Illinois Midland	Dec.	131	396,028	826	427,393	64,735	44,639	21,962	103,889	250,609	58.6	176,784	134,260	113,859	52,083
	12 mos.	131	3,657,093	8,293	3,919,833	515,116	746,371	235,776	943,947	2,662,735	67.9	1,257,098	887,136	924,597	591,158
Chicago & North Western	Dec.	8,327	4,949,089	1,031,351	6,870,003	1,129,806	1,441,875	163,595	2,925,633	5,966,618	86.9	903,385	467,153	284,569	199,321
	12 mos.	8,349	66,569,374	11,493,011	87,250,460	13,861,270	17,536,364	2,356,104	34,824,161	72,274,873	82.8	14,975,587	8,782,577	5,722,260	—125,511
Chicago, Burlington & Quincy	Dec.	9,018	6,244,918	758,296	8,065,886	582,480	1,357,990	242,192	2,924,450	5,378,121	66.7	2,687,765	2,039,723	1,738,974	1,650,048
	12 mos.	8,973	76,853,603	9,167,835	96,131,794	12,844,765	17,381,993	2,931,085	34,256,996	70,885,896	73.7	25,245,898	16,629,096	12,270,452	12,407,393
Chicago Great Western	Dec.	1,503	1,343,908	48,791	1,511,364	142,634	200,219	59,333	549,801	1,005,180	66.5	506,184	430,637	273,634	151,934
	12 mos.	1,505	16,372,358	480,523	18,128,103	2,258,831	2,680,403	709,182	6,648,368	12,905,667	71.2	5,222,436	4,061,036	1,779,771	593,476
Chicago, Indianapolis & Louisville	Dec.	549	670,466	50,112	799,372	54,849	126,274	29,911	244,727	503,464	63.0	295,908	250,438	104,822	22,805
	12 mos.	549	7,984,520	525,543	9,362,131	943,928	2,000,598	360,788	3,621,507	7,358,344	78.6	2,003,787	1,562,042	404,425	—414,285

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LIMA LOCOMOTIVE WORKS LIMA LOCOMOTIVE WORKS INCORPORATED INCORPORATED, LIMA, OHIO

REVENUES AND EXPENSES OF RAILWAYS

Month of December and Twelve Months of Calendar Year 1939—Continued

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income 1939	Net railway operating income 1938
Chicago, Milwaukee, St. Paul & Pacific	Dec.	10,890	$7,146,378	$790,470	$8,886,098	$939,230	$1,656,578	$237,719	$3,406,940	$6,619,568	74.5	$2,266,530	$1,636,530	$1,284,510	$1,007,187
	12 mos.	10,920	88,622,160	7,893,798	106,875,380	18,293,695	19,816,655	2,739,990	40,267,212	85,511,814	80.0	21,363,566	13,066,566	8,124,194	5,274,539
Chicago, Rock Island & Pacific	Dec.	7,858	4,838,848	765,199	6,253,248	751,127	1,205,759	264,626	2,448,874	4,987,632	79.8	1,265,616	933,504	597,033	578,733
	12 mos.	7,869	63,810,576	7,689,881	78,467,818	12,228,012	14,522,661	3,066,785	29,757,491	63,009,282	80.3	15,458,536	9,951,104	5,458,853	2,512,843
Chicago, St. Paul, Minneapolis & Omaha	Dec.	1,629	1,243,166	147,268	1,508,893	133,977	237,355	45,239	665,019	1,149,973	76.2	358,920	275,714	172,633	34,440
	12 mos.	1,629	15,135,901	1,444,056	17,751,689	2,560,245	3,022,850	477,147	7,975,250	14,829,541	83.5	2,922,148	1,613,896	313,556	—244,587
Clinchfield Railroad	Dec.	308	711,883	4,750	722,670	31,453	105,189	19,439	131,726	302,812	41.9	419,858	338,457	356,434	278,168
	12 mos.	308	7,168,394	39,984	7,276,464	502,148	1,229,730	230,393	1,357,771	3,509,476	48.2	3,766,988	3,067,134	3,286,120	2,237,387
Colorado & Southern	Dec.	787	428,602	27,691	525,098	54,774	103,115	12,823	211,791	408,716	77.8	116,382	29,322	12,938	—35,052
	12 mos.	790	5,497,803	362,807	6,505,491	635,987	1,259,863	167,054	2,499,881	4,876,988	75.0	1,628,503	704,798	488,241	102,510
Fort Worth & Denver City	Dec.	902	440,177	49,932	486,108	49,401	58,587	18,046	166,936	323,953	66.6	162,155	121,161	89,805	46,192
	12 mos.	902	5,486,012	588,428	6,007,703	647,415	936,040	220,990	2,084,362	4,289,305	71.4	1,718,398	1,264,989	803,230	907,108
Columbus & Greenville	Dec.	168	89,402	9,501	105,455	82,446	17,114	5,482	41,369	157,737	149.6	—52,282	—64,008	—62,341	8,668
	12 mos.	168	1,250,805	82,339	1,411,642	305,510	226,071	59,145	473,309	1,194,218	84.6	217,424	98,771	92,599	125,786
Delaware & Hudson	Dec.	846	1,942,419	76,712	2,110,365	252,510	412,774	41,796	817,446	1,610,312	76.3	500,053	434,243	396,146	595,418
	12 mos.	840	23,231,537	1,201,312	25,452,489	2,644,391	4,358,399	521,498	9,080,327	17,586,773	69.1	7,865,716	5,885,997	5,519,101	3,532,502
Delaware, Lackawanna & Western	Dec.	995	3,272,893	600,994	4,360,179	236,010	823,498	110,114	2,013,629	3,350,751	76.8	1,009,428	629,927	539,834	324,254
	12 mos.	990	38,336,144	6,649,041	50,454,438	3,318,597	9,392,781	1,336,231	22,762,395	38,535,007	76.4	11,919,431	6,778,930	6,028,688	2,509,621
Denver & Rio Grande Western	Dec.	2,552	1,904,427	106,083	2,124,943	153,843	490,469	67,741	758,345	1,556,084	73.2	568,859	394,423	337,574	244,030
	12 mos.	2,556	22,237,756	1,519,182	25,073,039	3,528,417	5,948,805	838,566	8,985,239	20,263,361	80.8	4,809,678	2,582,468	1,666,116	171,129
Denver & Salt Lake	Dec.	232	184,595	5,850	200,721	8,116	42,301	2,807	76,005	140,140	69.8	60,581	23,129	76,707	116,475
	12 mos.	232	2,113,691	66,766	2,290,818	349,604	489,191	30,978	710,127	1,690,981	73.8	599,837	250,032	800,866	877,224
Detroit & Mackinac	Dec.	242	55,597	2,652	65,404	7,377	13,274	1,372	24,386	49,761	76.1	15,643	12,513	7,724	5,964
	12 mos.	242	748,955	30,302	876,809	129,267	168,762	11,665	299,689	643,663	73.4	233,146	189,438	130,876	156,722
Detroit & Toledo Shore Line	Dec.	50	348,798	.....	350,320	18,749	21,141	9,587	84,806	143,050	40.8	207,270	176,742	113,999	85,734
	12 mos.	50	3,270,647	.....	3,284,540	287,122	254,396	107,375	964,285	1,714,184	52.2	1,570,356	1,214,997	624,927	358,358
Detroit, Toledo & Ironton	Dec.	472	645,179	210	674,642	57,629	94,785	14,536	152,306	344,039	51.0	330,603	253,338	226,612	254,114
	12 mos.	472	6,372,889	2,325	6,702,308	668,919	1,072,495	151,965	1,583,370	3,711,761	55.4	2,990,547	2,246,446	1,991,456	1,176,310
Duluth, Missabe & Iron Range	Dec.	541	139,648	1,827	170,861	241,815	226,631	4,454	227,393	718,006	420.2	—547,145	—583,837	—572,330	—439,560
	12 mos.	540	15,996,483	18,777	18,636,680	2,154,421	2,577,060	50,405	3,511,526	8,667,092	46.5	9,969,588	7,267,356	7,288,646	1,553,381
Duluth, Winnipeg & Pacific	Dec.	175	119,859	529	125,017	16,999	15,009	1,227	48,680	86,317	69.0	38,700	29,880	13,887	—10,337
	12 mos.	175	1,299,278	15,146	1,350,774	261,668	228,575	25,800	567,377	1,134,299	84.0	216,475	110,444	—51,499	—294,672
Elgin, Joliet & Eastern	Dec.	390	1,751,823	.....	2,028,164	119,800	320,353	15,006	736,267	1,225,575	60.4	802,58	590,241	452,187	346,991
	12 mos.	390	15,512,631	111	18,148,239	1,705,933	3,276,056	174,718	6,660,875	12,235,991	67.4	5,912,248	4,097,561	3,315,466	1,160,868
Erie	Dec.	2,283	6,127,911	426,453	7,051,757	615,761	1,543,772	193,098	2,763,828	5,386,035	76.4	1,665,722	1,134,224	761,175	545,671
	12 mos.	2,289	70,605,714	4,785,298	81,217,363	7,359,495	16,121,165	2,108,640	30,733,210	59,372,910	73.1	21,844,453	15,082,596	11,464,135	3,214,328
Florida East Coast	Dec.	685	559,657	202,198	910,167	104,484	179,402	41,042	327,912	713,763	78.4	196,404	168,791	126,426	140,060
	12 mos.	685	5,833,618	2,409,072	9,261,367	1,308,421	1,799,211	310,781	3,081,009	7,133,545	77.0	2,127,822	1,346,339	743,699	1,029,492
Georgia Railroad	Dec.	329	268,541	14,149	312,333	36,701	47,443	19,018	130,907	248,573	79.6	63,760	48,057	78,373	34,557
	12 mos.	329	3,299,959	143,122	3,742,674	411,089	627,188	223,948	1,585,068	3,013,344	80.5	729,330	540,296	700,628	523,741
Georgia & Florida	Dec.	408	93,740	2,023	99,595	21,804	14,985	8,540	38,526	88,687	89.0	10,908	9,471	4,335	—4,772
	12 mos.	408	1,126,205	21,686	1,194,319	250,684	192,413	100,582	442,428	1,047,784	87.7	146,535	56,595	1,917	—37,028
Grand Trunk Western	Dec.	1,029	1,923,081	90,277	2,187,280	169,551	383,463	23,200	826,602	1,480,642	67.7	706,638	585,172	520,363	339,273
	12 mos.	1,030	19,218,459	998,767	21,801,895	2,692,383	4,455,588	477,866	9,214,397	17,758,293	81.5	4,043,602	2,563,202	1,609,123	—788,981
Canadian National Lines in New England	Dec.	172	128,328	4,672	145,691	37,850	16,481	1,313	47,113	110,505	75.8	35,186	16,466	—16,770	—35,546
	12 mos.	172	1,230,319	69,913	1,434,432	429,731	235,644	32,349	752,354	1,512,036	105.4	—77,604	—275,873	—626,911	—629,455
Great Northern	Dec.	8,070	5,141,268	393,764	6,131,616	828,874	1,096,988	165,010	2,230,890	**4,557,197**	74.3	1,574,419	1,183,286	1,220,506	1,401,331
	12 mos.	8,072	80,001,678	4,350,621	91,783,373	11,259,128	15,431,415	2,276,335	28,501,753	60,462,670	65.9	31,320,703	21,199,234	19,584,595	14,479,276
Green Bay & Western	Dec.	234	127,295	342	132,601	36,810	19,128	6,953	41,614	106,945	80.6	25,656	7,752	1,199	—9,583
	12 mos.	234	1,633,263	4,813	1,696,275	330,445	193,233	77,707	565,209	1,225,185	72.2	471,090	299,367	193,229	134,576
Gulf & Ship Island	Dec.	259	71,733	4,789	86,277	20,453	15,299	2,728	48,016	90,835	105.3	—4,558	—20,661	—27,312	—16,311
	12 mos.	259	974,735	45,432	1,134,564	262,383	186,915	30,800	565,083	1,093,276	96.4	41,288	—160,401	—257,223	—305,485
Gulf, Mobile & Northern	Dec.	824	543,380	25,678	593,896	81,825	85,373	41,176	161,461	418,658	70.5	175,238	117,438	71,162	72,562
	12 mos.	824	6,405,861	235,029	6,924,301	917,700	1,020,713	479,866	1,825,489	4,687,365	67.7	2,236,936	1,599,736	1,130,851	830,410

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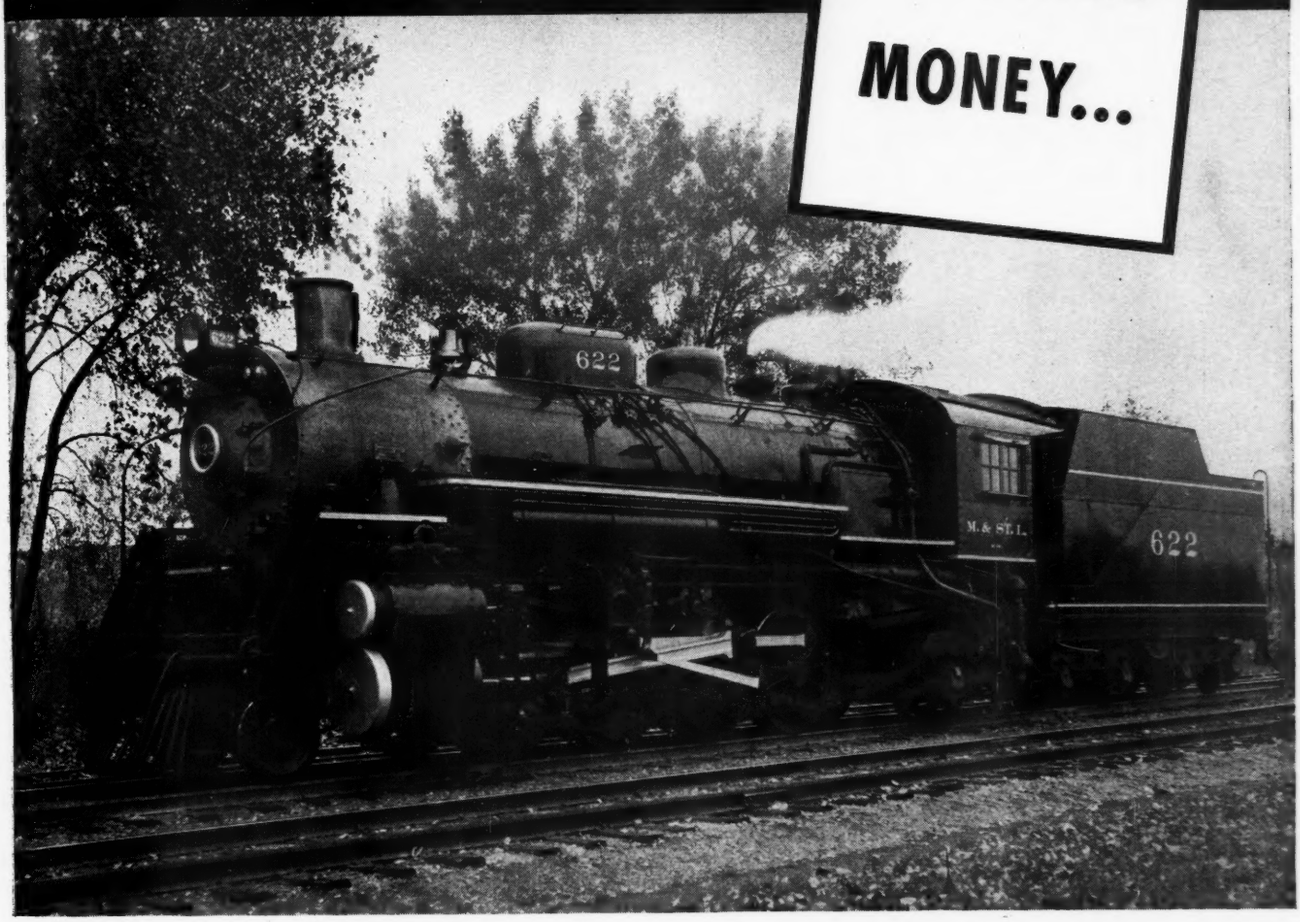
MODERNIZED TO MAKE MONEY...



...and making it!

Recently these Mikados of the Minneapolis & St. Louis Railroad underwent drastic modernization... Franklin E-2 Buffers, Franklin Automatic Compensators & Snubbers, and *Locomotive Boosters** were applied. The results have proved the effectiveness of planned modernization.

The Locomotive Booster raised the tractive effort to 61,300 lbs., and the mileage has been increased from 3,000 to 7,000 miles per month. The capacity has been increased 1,000 tons per train . . . and the time cut in half.

By speeding up operation the capacity of the road has been increased, and car hire charges substantially reduced. Thanks to the newly modernized power and progressive policy, the railroad is now operating on a profit.

*Trademark Reg. U. S. Pat. Off

It Pays To Modernize With Franklin Economy Devices

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK
CHICAGO
MONTREAL

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1939—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Maintenance of—Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income 1939	Net railway operating income 1938
Illinois Central	Dec.	4,949	$7,116,893	$903,956	$8,691,204	$854,534	$1,520,639	$211,072	$3,060,385	$5,969,350	68.7	$2,721,854	$1,963,293	$1,934,482	$1,758,565
	12 mos.	4,949	80,135,559	8,807,811	96,359,355	9,781,458	19,601,373	2,301,229	35,767,257	71,283,448	74.0	25,075,907	16,578,244	15,717,031	14,712,384
Yazoo & Mississippi Valley	Dec.	1,619	978,667	79,171	1,141,470	164,700	159,609	33,350	512,737	915,692	80.2	225,778	126,838	53,050	88,626
	12 mos.	1,619	13,385,997	721,371	15,011,497	1,479,307	2,097,174	362,146	5,897,992	10,363,255	69.0	4,648,242	3,012,963	2,096,097	2,103,975
Illinois Central System	Dec.	6,568	8,095,560	983,127	9,832,674	1,019,234	1,680,248	244,422	3,573,122	6,885,042	70.0	2,947,632	2,088,078	1,995,961	1,856,602
	12 mos.	6,568	93,521,556	9,529,182	111,370,852	11,260,765	21,698,547	2,663,375	41,665,249	81,646,703	73.3	29,724,149	19,566,552	17,914,099	16,927,170
Illinois Terminal	Dec.	481	397,087	72,287	508,254	46,559	66,529	16,045	170,306	317,751	62.52	190,503	153,867	129,636	101,192
	12 mos.	485	4,657,470	725,124	5,901,780	641,653	826,383	196,698	1,995,612	3,877,583	65.70	2,024,197	1,530,057	1,275,333	830,691
Kansas City Southern	Dec.	879	1,024,925	30,363	1,183,044	111,112	172,426	60,385	367,600	754,131	63.7	428,913	316,913	254,891	214,681
	12 mos.	879	11,642,968	275,281	13,384,889	1,160,008	1,979,024	655,982	3,923,239	8,379,970	62.6	5,004,919	3,758,919	3,157,032	2,866,815
Kansas, Oklahoma & Gulf	Dec.	328	190,191	454	193,221	53,469	11,883	11,102	44,172	130,764	67.7	62,457	22,023	6,705	76,689
	12 mos.	327	2,670,562	4,908	2,707,681	400,470	201,730	108,433	506,295	1,285,743	47.5	1,421,938	1,079,186	864,909	692,043
Lake Superior & Ishpeming	Dec.	156	27,137	67	28,978	20,685	27,576	472	20,018	78,219	269.9	—49,241	—75,181	—75,671	—81,959
	12 mos.	156	2,413,771	720	2,932,258	288,293	263,772	7,160	482,409	1,125,556	38.4	1,806,702	1,213,719	1,209,260	—79,608
Lehigh & Hudson River	Dec.	96	130,450	.....	131,432	11,013	26,471	3,410	46,709	93,697	71.3	37,735	25,321	14,882	30,710
	12 mos.	96	1,584,408	685	1,594,002	162,536	271,998	41,751	538,993	1,092,973	68.6	501,029	317,029	184,117	128,218
Lehigh & New England	Dec.	190	335,702	.....	338,787	78,141	64,333	6,695	114,294	277,534	81.9	61,253	73,138	84,258	97,940
	12 mos.	196	4,256,219	.....	4,286,652	456,158	717,484	80,349	1,328,052	2,766,018	64.5	1,520,634	1,169,096	1,235,324	705,981
Lehigh Valley	Dec.	1,282	3,522,735	209,211	3,969,475	203,900	574,659	113,122	1,682,982	2,697,591	68.0	1,271,884	1,065,562	816,506	820,918
	12 mos.	1,283	40,428,058	2,216,171	45,358,987	3,031,897	7,924,053	1,313,056	19,058,643	32,792,246	72.3	12,566,741	9,551,557	7,149,326	3,906,449
Louisiana & Arkansas	Dec.	847	653,745	9,040	694,536	84,408	83,533	31,397	218,809	453,406	65.3	241,130	183,202	129,398	125,357
	12 mos.	847	7,304,845	94,274	7,690,340	1,094,730	1,007,374	414,294	2,101,836	4,933,386	64.2	2,756,954	2,108,161	1,588,028	1,329,866
Louisville & Nashville	Dec.	4,871	6,632,045	645,928	7,816,895	1,034,436	1,727,040	175,456	2,728,170	5,932,560	75.9	1,884,335	1,358,858	1,339,545	1,298,476
	12 mos.	4,907	76,492,009	6,013,271	88,348,256	9,407,133	20,288,871	2,134,135	29,987,122	64,989,535	73.6	23,358,721	15,223,021	15,848,660	11,622,971
Maine Central	Dec.	991	835,092	90,404	1,042,156	24,747	207,612	11,150	368,137	649,191	62.3	392,965	323,868	261,689	165,400
	12 mos.	994	9,872,954	985,593	11,990,440	1,605,496	1,966,108	147,147	4,375,225	8,504,984	70.9	3,485,456	2,687,867	2,181,323	1,367,269
Midland Valley	Dec.	352	124,990	1	126,711	19,641	7,316	3,231	34,129	71,449	56.4	55,262	44,218	34,030	60,413
	12 mos.	352	1,383,007	34	1,402,898	178,266	115,216	30,849	371,698	766,455	54.6	636,443	494,484	398,230	408,771
Minneapolis & St. Louis	Dec.	1,512	692,363	8,155	734,453	85,520	117,921	53,773	267,766	562,985	76.7	171,468	125,080	95,362	42,231
	12 mos.	1,518	8,687,455	94,711	9,215,137	1,382,704	1,475,910	574,406	3,232,461	7,094,693	77.0	2,120,444	1,561,244	1,046,545	679,104
Minneapolis, St. Paul & Sault Ste. Marie	Dec.	4,285	1,751,432	84,000	2,010,222	383,991	391,669	63,883	927,046	1,849,794	92.0	160,428	—15,388	—31,493	—81,366
	12 mos.	4,289	24,847,841	1,106,325	28,163,238	4,151,800	4,583,719	755,435	11,346,912	21,903,008	77.8	6,260,230	4,080,960	2,826,813	—224,884
Duluth, South Shore & Atlantic	Dec.	550	140,557	11,185	168,003	19,285	25,983	6,330	78,183	136,405	81.2	31,598	17,984	17,163	—25,170
	12 mos.	550	1,985,761	109,210	2,327,828	455,545	415,332	67,813	996,420	2,017,949	86.7	309,879	138,401	83,087	—126,865
Spokane International	Dec.	152	50,094	934	57,709	7,929	6,234	2,149	21,667	42,161	73.1	15,548	9,130	4,928	10,047
	12 mos.	152	709,462	10,489	798,188	170,427	87,017	24,654	267,782	602,488	75.5	195,700	139,334	96,238	56,461
Mississippi Central	Dec.	150	66,833	2,657	72,321	12,101	7,534	7,190	22,669	54,184	74.9	18,137	15,701	10,915	—2,495
	12 mos.	150	811,482	23,566	863,319	257,773	113,934	84,311	240,213	753,292	87.3	110,027	55,754	—8,072	37,965
Missouri & Arkansas	Dec.	365	88,089	1,789	96,507	36,884	13,541	9,005	36,213	105,667	109.5	—9,160	—24,371	—33,240	—2,072
	12 mos.	365	1,014,200	18,711	1,107,939	275,554	125,379	81,125	355,057	907,196	81.9	200,743	138,173	40,212	6,972
Missouri-Illinois	Dec.	193	173,048	359	176,183	7,384	17,053	3,034	49,284	82,316	46.7	93,867	65,168	54,091	52,066
	12 mos.	193	2,222,695	4,433	2,251,238	283,514	204,110	36,899	598,548	1,179,742	52.4	1,071,496	842,401	641,420	100,617
Missouri-Kansas-Texas Lines	Dec.	3,294	1,706,103	205,833	2,177,915	250,482	348,927	116,885	870,783	1,713,674	78.7	464,241	295,247	113,766	119,896
	12 mos.	3,294	23,276,060	2,098,939	28,170,695	3,945,679	4,805,256	1,341,552	10,684,067	22,320,830	79.2	5,849,865	3,455,373	1,284,208	865,737
Missouri Pacific	Dec.	7,146	5,948,727	402,017	6,996,797	925,681	1,351,620	237,737	2,608,283	5,374,617	76.8	1,622,180	1,350,929	980,777	581,456
	12 mos.	7,159	70,860,076	4,901,819	83,059,361	12,894,036	16,434,101	2,836,390	30,355,001	65,526,281	78.9	17,533,080	11,877,968	7,195,989	5,479,496
Gulf Coast Lines	Dec.	1,759	1,163,448	46,002	1,294,676	185,256	197,956	44,544	399,999	876,885	67.73	417,791	355,071	227,124	167,836
	12 mos.	1,759	13,650,199	457,803	14,899,012	2,296,991	2,359,809	537,752	4,534,004	10,319,276	69.26	4,579,736	3,711,441	2,467,863	1,765,892
International Great Northern	Dec.	1,155	755,261	81,025	977,040	156,149	200,795	30,494	438,935	878,663	89.9	98,377	41,969	—29,259	—95,108
	12 mos.	1,155	9,181,090	864,687	11,416,814	1,845,572	2,268,098	364,612	4,864,201	9,976,290	87.4	1,440,524	721,860	—204,174	—602,061
Mobile & Ohio	Dec.	1,180	846,890	34,420	934,371	154,502	185,366	42,009	314,185	727,922	77.9	206,449	160,286	102,506	40,576
	12 mos.	1,180	10,875,203	316,629	11,736,534	1,806,356	2,218,953	514,998	4,094,891	9,175,380	78.2	2,561,154	1,821,236	1,024,006	964,186
Monongahela	Dec.	172	396,463	737	400,575	27,188	34,363	493	84,376	149,319	37.3	251,256	217,560	138,817	128,586
	12 mos.	172	4,125,964	7,152	4,155,889	387,466	348,987	5,801	891,169	1,665,038	40.1	2,490,851	2,097,608	1,254,230	935,507

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NO. 110 OF A SERIES OF FAMOUS ARCHES OF THE WORLD

MILLERS DALE VIADUCT

ENGLAND

This 390 ft. viaduct, which is situated between Rowsley and Millers Dale Junction on the London and Manchester trunk route of the London, Midland & Scottish Railway, was constructed in 1862. The superstructure consists of three spans of 50 ft. 6 in. on the square and 87 ft. 8 in. on the skew over the River Wye and the public highway. In addition to these three spans there are an additional three spans that extend 28 ft. on the square over the adjoining land. The piers and abutments of this double track viaduct are of stone masonry.

* * * * * *

31 years ago the American Arch Company demonstrated to the railroads the practicality of standardizing Arch tubes and Arch Brick sizes and designs. Today, although it has been constantly developed to keep pace with modern railroading, the Security Sectional Arch is still standard on American railroads.

There's More to SECURITY ARCHES *Than Just Brick*

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED
60 EAST 42nd STREET, NEW YORK, N. Y.
Locomotive Combustion Specialists

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1939—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income 1939	Net railway operating income 1938
Montour	Dec.	51	$119,960	.....	$121,399	$8,455	$37,036	$937	$36,689	$90,812	74.3	$30,587	$13,804	$52,126	$45,511
	12 mos.	54	1,921,192	.....	1,940,055	132,059	493,464	11,612	440,436	1,162,860	59.9	777,195	514,819	843,516	660,273
Nashville, Chattanooga & St. Louis	Dec.	1,111	929,517	$114,763	1,200,667	128,832	289,208	67,901	544,078	1,084,676	90.3	115,991	80,637	60,354	—10,588
	12 mos.	1,111	12,173,225	1,078,102	14,827,811	1,650,927	2,835,645	782,589	5,718,986	11,648,855	78.6	3,178,956	2,244,660	1,982,653	1,481,936
Nevada Northern	Dec.	165	59,403	649	65,303	7,397	2,609	1,180	10,745	27,200	41.7	38,103	28,495	30,305	22,101
	12 mos.	165	600,282	9,466	666,893	97,695	41,371	14,640	123,107	337,117	50.6	329,776	196,194	225,509	161,160
New York Central	Dec.	11,025	22,089,185	5,935,770	31,801,523	3,450,347	7,040,583	617,911	11,864,230	24,204,040	76.1	7,597,483	6,323,581	4,614,358	2,803,821
	12 mos.	11,037	240,130,665	61,412,817	341,086,708	36,401,031	70,409,084	6,877,167	128,370,420	256,884,232	75.3	84,202,476	52,466,786	37,303,427	15,582,476
Pittsburgh & Lake Erie	Dec.	233	1,792,923	51,239	1,912,348	97,211	624,545	28,431	566,437	1,390,687	72.7	521,661	301,360	514,798	76,573
	12 mos.	233	18,146,583	480,827	19,250,994	1,801,034	6,790,214	327,695	5,925,047	15,772,323	81.9	3,478,671	1,435,990	3,806,716	1,803,166
New York, Chicago & St. Louis	Dec.	1,704	3,864,841	78,042	4,064,762	335,358	637,456	120,165	1,322,801	2,529,309	62.2	1,535,453	1,262,762	983,601	751,695
	12 mos.	1,704	40,977,145	841,332	43,175,402	4,318,095	6,554,383	1,454,650	14,832,576	28,559,574	66.1	14,615,828	11,873,808	8,437,279	5,058,132
New York, New Haven & Hartford	Dec.	1,867	4,104,027	2,477,323	7,403,823	769,041	1,086,514	103,874	2,724,534	5,042,098	68.1	2,361,725	1,871,339	1,240,356	838,768
	12 mos.	1,873	47,525,678	27,381,782	83,418,476	11,021,935	13,737,395	1,315,023	31,010,775	61,459,160	73.7	21,959,316	15,766,930	8,462,922	517,047
New York Connecting	Dec.	21	177,028	.....	190,474	23,319	10,940	.....	60,954	96,503	50.7	93,971	51,833	70,760	253,552
	12 mos.	21	2,367,835	.....	2,503,397	293,815	128,539	.....	408,653	846,673	33.8	1,656,724	1,165,234	1,318,029	1,309,242
New York, Ontario & Western	Dec.	576	368,866	16,537	426,662	44,958	91,978	16,768	224,685	400,449	93.9	26,213	3,602	—23,661	19,076
	12 mos.	576	5,171,175	331,246	6,014,157	679,008	1,280,270	198,443	3,095,685	5,519,525	91.8	494,632	—47,962	—496,674	—599,496
New York, Susquehanna & Western	Dec.	144	234,963	17,091	265,699	14,110	26,104	3,488	115,238	174,902	65.8	90,797	66,818	39,470	—14,368
	12 mos.	145	2,651,164	217,432	3,005,614	265,642	325,389	41,570	1,201,014	1,998,517	66.5	1,007,097	655,410	264,337	48,827
Norfolk & Western	Dec.	2,191	7,690,998	200,296	8,169,401	912,772	1,309,210	161,152	1,846,367	4,439,170	54.3	3,730,231	2,281,519	2,683,887	2,744,288
	12 mos.	2,191	88,549,647	1,903,724	93,115,128	9,266,189	17,436,573	1,712,475	20,378,629	51,118,388	54.9	41,996,740	28,537,404	31,659,216	21,722,288
Norfolk Southern	Dec.	805	337,942	4,164	357,686	56,573	51,188	25,280	135,147	286,637	80.1	71,049	40,729	24,639	—15,281
	12 mos.	805	4,403,240	44,371	4,626,867	862,440	631,120	296,616	1,690,953	3,660,438	79.1	966,429	576,940	350,933	222,259
Northern Pacific	Dec.	6,720	3,996,358	365,332	4,880,848	330,822	628,698	154,358	1,842,052	3,177,481	65.1	1,703,367	1,226,117	1,537,480	1,113,598
	12 mos.	6,721	54,516,436	3,755,303	63,882,432	8,570,368	12,722,353	2,019,507	23,045,414	49,679,727	77.8	14,202,705	7,437,747	10,479,237	6,297,356
Northwestern Pacific	Dec.	352	143,368	42,396	211,233	68,607	22,937	3,271	149,219	255,946	121.2	—44,713	—63,364	—74,815	—88,940
	12 mos.	352	2,297,984	639,814	3,266,653	701,886	555,407	40,121	1,849,925	3,281,678	100.5	—15,025	—238,074	—354,801	—921,446
Oklahoma City-Ada-Atoka	Dec.	132	31,384	345	33,571	5,963	1,837	935	12,791	23,652	70.5	9,919	4,994	510	—4,801
	12 mos.	132	378,075	3,629	404,056	86,674	17,589	9,499	130,987	264,907	65.6	139,149	105,452	57,447	18,686
Pennsylvania	Dec.	10,270	29,918,373	6,505,076	40,063,719	3,691,326	8,245,507	792,023	14,249,631	28,088,863	70.1	11,974,856	9,380,115	8,904,078	6,451,172
	12 mos.	10,287	320,960,493	71,106,822	430,930,778	42,435,401	89,023,540	8,630,228	152,304,770	306,900,835	71.2	124,029,943	83,934,096	77,304,328	57,332,898
Long Island	Dec.	379	563,503	1,215,855	1,874,503	180,091	259,266	7,715	985,295	1,469,687	78.4	404,816	170,830	—71,739	—195,701
	12 mos.	382	6,814,224	17,562,293	25,558,213	2,504,023	4,068,128	145,942	12,024,663	19,170,491	75.0	6,387,722	2,771,843	258,095	—217,965
Pennsylvania-Reading Seashore Lines	Dec.	411	287,240	91,442	401,290	40,621	81,485	7,710	266,608	416,773	103.9	—15,483	—73,636	—156,860	—203,330
	12 mos.	412	3,314,371	2,254,412	5,830,236	906,500	922,461	86,742	3,536,678	5,654,991	97.0	175,245	—756,195	—1,812,029	—2,133,217
Pere Marquette	Dec.	2,115	2,589,405	82,629	2,811,173	382,889	555,850	60,022	1,019,300	2,110,839	75.1	700,334	522,367	404,017	340,624
	12 mos.	2,115	27,621,805	936,359	30,232,639	4,015,097	6,273,816	764,308	11,271,308	23,478,759	77.7	6,753,880	4,778,467	3,352,085	853,602
Pittsburg & Shawmut	Dec.	101	59,428	.....	59,324	10,275	18,689	1,448	19,338	53,853	90.8	5,471	2,222	1,292	5,825
	12 mos.	101	698,645	.....	702,699	139,430	207,370	18,541	213,317	620,468	88.3	82,231	51,320	32,648	—74,257
Pittsburgh & West Virginia	Dec.	136	351,865	.....	369,915	39,395	70,225	21,042	74,769	231,722	62.6	138,193	112,660	126,154	77,514
	12 mos.	136	3,471,724	349	3,670,690	418,224	755,947	180,439	782,803	2,418,071	65.9	1,252,619	970,294	1,076,852	627,867
Pittsburg, Shawmut & Northern	Dec.	190	93,760	.....	94,832	7,815	13,515	1,251	30,550	58,340	61.5	36,492	35,179	23,649	22,311
	12 mos.	190	985,776	.....	994,123	160,457	148,106	11,714	325,586	713,048	71.7	281,075	226,471	116,598	45,096
Reading	Dec.	1,450	4,658,083.	301,432	5,210,081	379,175	939,974	69,088	2,008,409	3,550,532	68.1	1,659,549	1,244,759	1,110,931	1,187,599
	12 mos.	1,450	50,999,086	3,203,917	56,744,549	4,588,987	10,227,524	841,772	22,157,418	39,612,689	69.8	17,131,360	12,651,497	11,931,004	10,104,324
Richmond, Fredericksburg & Potomac	Dec.	118	415,189	298,567	938,116	71,085	136,056	10,459	303,179	553,470	59.0	384,646	273,046	220,828	174,720
	12 mos.	118	4,779,461	2,572,234	8,752,235	885,055	1,627,112	114,846	3,239,650	6,374,277	72.8	2,377,958	1,615,088	1,214,910	635,005
Rutland	Dec.	407	182,028	23,438	300,575	7,645	53,770	10,513	138,033	219,773	73.1	80,802	54,213	56,000	2,491
	12 mos.	407	2,335,038	350,960	3,456,841	428,516	660,081	124,712	1,716,472	3,053,541	88.3	403,300	162,979	135,445	—530,677
St. Louis-San Francisco	Dec.	4,820	3,127,596	307,341	3,802,974	452,907	883,018	124,849	1,466,833	3,103,549	81.6	699,425	489,185	534,771	404,511
	12 mos.	4,828	38,586,351	3,215,508	45,685,303	6,816,979	10,858,778	1,427,926	17,121,666	38,359,995	84.0	7,325,308	3,568,211	3,886,751	1,192,550
St. Louis, San Francisco & Texas	Dec.	235	132,792	336	138,380	23,539	15,482	8,286	55,685	109,812	79.4	28,568	22,651	—739	4,409
	12 mos.	264	1,511,523	5,981	1,589,981	294,362	180,424	96,831	637,469	1,288,263	81.0	301,718	202,681	—96,547	—92,191

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REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER AND TWELVE MONTHS OF CALENDAR YEAR 1939—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income: 1939	1938
St. Louis Southwestern Lines	Dec.	1,690	$1,568,857	$34,540	$1,682,782	$216,276	$364,328	$90,621	$562,102	$1,308,695	77.8	$374,087	$283,784	$151,147	$318,866
	12 mos.	1,693	18,423,520	330,835	19,609,966	3,946,836	3,507,467	998,477	6,219,787	15,597,771	79.5	4,012,195	2,673,885	1,142,599	2,020,021
Seaboard Air Line	Dec.	4,314	3,083,059	713,028	4,222,937	578,300	795,654	188,199	1,580,530	3,353,583	79.4	869,354	1,066,244	910,900	432,315
	12 mos.	4,316	33,665,636	6,312,965	44,163,420	6,663,292	8,887,440	2,043,262	16,571,357	36,493,168	82.6	7,670,252	4,822,142	3,594,371	1,449,486
Southern Railway	Dec.	6,520	7,108,973	903,069	8,736,131	713,195	1,477,648	169,048	3,013,344	5,703,000	65.3	3,033,131	2,655,245	2,333,805	2,410,352
	12 mos.	6,559	82,344,875	8,741,860	99,153,560	11,733,956	16,653,076	1,901,729	33,900,760	68,009,468	68.6	31,144,092	23,329,539	20,521,866	14,343,565
Alabama Great Southern	Dec.	315	541,302	62,966	652,992	37,030	142,454	14,091	194,850	411,783	63.1	241,209	148,665	162,223	206,561
	12 mos.	315	6,598,912	575,868	7,677,582	990,918	1,577,470	159,367	2,208,723	5,215,904	67.9	2,461,678	1,579,454	1,768,249	1,414,642
Cincinnati, New Orleans & Texas Pacific	Dec.	337	1,310,816	131,496	1,542,904	85,095	314,918	30,268	393,128	883,873	57.3	659,031	544,754	565,476	513,003
	12 mos.	337	15,647,163	1,110,893	17,788,489	2,072,360	3,450,809	352,020	4,414,128	10,924,351	61.4	6,864,138	5,050,867	5,185,059	3,996,689
Georgia Southern & Florida	Dec.	398	142,007	57,116	225,256	25,102	26,831	1,588	84,879	146,038	64.8	79,218	79,521	69,646	77,229
	12 mos.	398	1,601,832	460,697	2,309,592	378,806	434,334	20,860	984,593	1,899,643	82.3	409,949	232,039	118,778	29,789
New Orleans & Northeastern	Dec.	204	225,918	20,336	268,448	24,700	31,042	5,528	77,898	150,949	56.2	117,499	91,332	64,475	56,054
	12 mos.	204	2,693,251	195,497	3,107,907	392,218	413,291	68,196	902,588	1,917,726	61.7	1,190,181	782,107	503,713	415,098
Northern Alabama	Dec.	100	81,628	1,340	84,997	10,401	1,489	1,289	27,279	42,438	49.9	42,559	35,089	30,506	18,978
	12 mos.	100	658,502	12,052	692,380	136,703	15,340	11,924	218,581	404,444	58.4	287,936	215,635	109,264	36,096
Southern Pacific	Dec.	8,648	10,739,154	1,703,457	13,828,983	1,260,059	2,212,988	518,321	5,266,249	10,054,499	72.7	3,774,484	2,661,584	1,965,076	1,515,359
	12 mos.	8,656	129,616,129	22,148,104	166,623,094	15,651,265	28,786,820	4,689,722	61,175,893	120,266,896	72.2	46,356,198	32,046,557	23,115,495	10,947,283
Southern Pacific Steamship Lines	Dec.	....	666,409	9,784	716,463	15,063	110,546	15,132	525,993	691,912	96.6	24,551	—720	—2,285	13,829
	12 mos.	....	6,644,726	372,347	7,378,268	179,730	1,300,408	214,992	5,128,761	7,017,348	95.1	360,920	143,848	139,497	12,698
Texas & New Orleans	Dec.	4,416	3,148,080	344,432	3,875,423	523,255	586,677	127,464	1,304,349	2,750,302	71.0	1,125,121	868,970	627,781	510,923
	12 mos.	4,416	36,454,453	3,447,863	43,571,527	6,320,822	7,207,213	1,486,788	14,685,061	32,157,379	73.8	11,414,148	7,848,299	5,173,418	3,337,021
Spokane, Portland & Seattle	Dec.	948	556,881	35,215	658,437	111,533	66,459	10,645	264,619	476,430	72.4	182,007	72,479	—97,506	4,153
	12 mos.	948	7,513,420	450,731	8,645,562	1,585,395	1,038,985	127,624	3,107,580	6,194,682	71.7	2,450,880	1,527,089	821,023	721,778
Tennessee Central	Dec.	286	207,900	6,071	227,157	19,143	32,214	7,151	74,562	142,435	62.7	84,722	62,097	57,811	27,153
	12 mos.	286	2,266,689	50,379	2,462,150	410,323	378,554	78,663	851,428	1,837,060	74.6	625,090	463,799	298,841	243,256
Texas & Pacific	Dec.	1,936	1,841,557	228,535	2,300,935	330,157	493,790	73,581	712,735	1,733,699	75.3	567,236	414,571	378,920	475,529
	12 mos.	1,936	21,950,291	2,246,643	26,454,096	3,092,845	5,231,829	877,217	8,396,191	18,972,438	71.7	7,481,658	5,514,853	4,365,221	4,771,419
Texas Mexican	Dec.	162	65,836	324	78,983	9,530	11,188	3,209	35,956	65,402	82.8	13,581	7,322	3,473	—2,833
	12 mos.	162	780,687	4,788	933,196	128,166	119,514	35,786	389,182	738,848	79.2	194,348	123,563	82,469	10,790
Toledo, Peoria & Western	Dec.	239	191,373	.....	193,542	32,832	16,175	20,931	55,028	146,162	75.5	47,380	39,793	21,343	35,125
	12 mos.	239	2,247,133	66	2,280,008	462,377	170,011	199,873	526,364	1,496,873	65.7	783,135	531,791	346,484	329,071
Union Pacific System	Dec.	9,898	10,663,231	1,451,983	13,513,772	696,143	1,950,633	379,865	4,592,577	8,137,039	60.2	5,376,733	3,883,330	3,164,996	2,646,369
	12 mos.	9,901	132,491,663	17,630,948	164,253,371	18,546,352	30,195,782	4,970,557	55,229,218	117,858,588	71.8	46,394,783	30,107,175	20,233,188	19,867,391
Utah	Dec.	111	94,659	.....	94,865	Cr. 727	30,499	467	26,685	61,019	64.3	33,846	21,943	23,348	20,584
	12 mos.	111	821,112	.....	823,326	106,744	291,118	5,536	222,016	672,046	81.6	151,280	45,888	61,624	—50,031
Virginian	Dec.	638	1,933,458	3,903	1,983,704	100,415	371,759	24,582	285,531	806,317	40.6	1,177,387	877,387	947,093	900,121
	12 mos.	638	20,949,030	34,143	21,476,933	1,874,487	4,382,111	284,534	3,039,014	9,953,297	46.3	11,523,636	8,443,636	9,028,510	7,879,135
Wabash	Dec.	2,409	3,632,416	263,409	4,214,016	537,524	622,889	151,303	1,713,841	3,100,763	73.6	1,113,253	960,981	645,945	444,959
	12 mos.	2,409	39,035,218	2,426,287	44,662,526	5,839,081	7,384,612	1,781,615	17,471,583	34,245,140	76.7	10,417,386	7,846,958	3,559,246	1,297,490
Ann Arbor	Dec.	294	303,654	2,635	313,396	21,891	62,762	13,522	142,233	248,021	79.1	65,375	42,755	30,539	34,470
	12 mos.	294	3,774,643	45,673	3,964,804	335,132	800,923	156,963	1,739,309	3,172,751	80.0	792,053	529,408	368,563	118,136
Western Maryland	Dec.	859	1,630,388	7,044	1,723,288	144,650	319,900	38,905	418,930	972,054	56.4	751,234	624,564	622,148	479,379
	12 mos.	870	15,940,384	83,030	16,518,180	1,943,318	3,447,776	469,276	4,415,987	10,850,369	65.7	5,667,811	4,656,141	4,775,969	3,643,434
Western Pacific	Dec.	1,208	1,297,681	26,922	1,351,664	140,421	242,742	60,016	554,919	1,047,229	77.5	304,435	229,885	128,833	283,883
	12 mos.	1,208	15,670,744	640,197	16,689,989	2,361,235	2,889,066	734,742	6,319,104	12,998,764	77.9	3,691,225	2,689,820	1,674,490	—932,450
Wheeling & Lake Erie	Dec.	508	1,288,940	.....	1,350,376	129,281	316,321	47,444	414,049	963,522	71.4	386,854	285,368	374,540	279,363
	12 mos.	508	14,168,164	34	14,919,230	1,725,009	3,067,468	450,577	4,492,148	10,136,644	67.9	4,782,586	3,204,526	4,083,761	2,184,561